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Miami International Airport

# Fumigation Facility Project Book

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Miami-Dade Aviation Department

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# 1. EXECUTIVE SUMMARY

Miami-Dade Aviation Department (MDAD) completed the initial planning stage(s) of the cargo facilities modernization program at Miami International Airport (MIA or the Airport). The program determined that the areas currently occupied by fumigation facilities will be necessary for cargo development and concluded all fumigation facilities within Airport property will be displaced from their current locations. Therefore, Miami-Dade Aviation Department engaged the Consultant Team to prepare this Project Book for a consolidated fumigation facility with the following objectives:

- Define current fumigation needs at MIA based on existing operators.
- Develop concepts for relocation and consolidation within the selected site.
- Provide general guidance to architectural and/or engineering consultants to facilitate and proceed with the design effort of these facilities.

As part of the preparation of this Project Book, the Consultant Team undertook an extensive data-collection effort and conducted an inventory of existing conditions of the fumigation facilities at the Airport. The Consultant Team conducted on-site visits and performed a benchmark analysis to understand the current operations and to identify key operational needs and deficiencies to meet existing and future service demand.

Following the completion of the inventory, the Consultant Team completed the future facility requirements analysis, which identified the need for one fumigation facility to accommodate 2025 demand, with expansion capability to accommodate the 2035 demand.



## 2. PROJECT OVERVIEW

### 2.1 STUDY BACKGROUND

The Miami International Airport (MIA or the Airport) Strategic Airport Master Plan 2015–2050 Study identified airfield, terminal, landside, and other Airport support facilities needed to accommodate 30 million annual enplaned passengers, 565,000 total aircraft operations, and 4.2 million tons of cargo over a planning horizon ending in fiscal year (FY) 2035.

The cargo facilities modernization program for MIA identified the need to relocate the existing fumigation operators from their current locations. However, the relocation of these operators requires significant study and programming, beyond what is typically conducted as part of a master planning study. Therefore, Miami-Dade Aviation Department (MDAD) engaged the Consultant Team to undertake an advanced planning study for a new fumigation facility to consolidate the current operators into one location. This advanced planning study utilizes existing and future fumigation demand levels.

Additionally, MDAD identified this future fumigation facility as a building that will boost the attractiveness of MIA as a cargo hub. MIA receives perishable freight cargo by air and by sea as part of the Ocean-to-Air Perishables Transshipment Program. Through this program, cargo shippers save time and money with expedited air transport of perishable products arriving by sea to international markets via MIA.

Perishables degrade over a given period, or if exposed to extreme temperatures, humidity, or other environmental stressors. Thus, it is critical to handle (including processes, such as fumigation), store, and refrigerate these commodities properly through the entire logistics and value chain, from harvest to retail shelf. To minimize product deterioration and value loss, perishables must be delivered to the consumer as quickly as possible with the highest quality possible.

### 2.2 OVERVIEW OF A FUMIGATION FACILITY

Fumigation is a method of pest control that diffuses gaseous pesticides in a sealed space to eliminate the pests that could live within.

#### ***Type of Fumigation Facilities***

The two types of fumigation facilities discussed in this study are the following:

- **Outdoor:** open-air facilities that provide tarp or tarpless fumigation of entire tractor-trailers/containers and require a 200-foot buffer around the fumigation area
- **Enclosed:** indoor facilities, including fumigation chambers, that allow fumigation of palletized commodities or entire tractor-trailers/containers without the 200-foot buffer, provided the chambers are equipped with a gas recovery function

#### ***Fumigation Process***

International cargo, both perishable and nonperishable goods, arriving in Miami by air or by sea and requiring fumigation to eliminate possible domestic infestation of exotic organisms will first clear U.S. Customs and Border Protection (CBP) before proceeding to a U.S. Department of Agriculture (USDA) sanctioned fumigation facility. Commodities are typically transported from the port of entry to the fumigation facility via tractor-trailer or via

shipping container on a flatbed truck. Once the commodities are introduced into the sealed space, the fumigants are released into the space. The gas is then held within the sealed area, for a set period, until the pest is eliminated. USDA monitor each fumigation to ensure that effective fumigant concentration levels are maintained throughout the treatment. Once USDA confirms the commodities have been cleared, the space is aerated until the gas concentration levels are validated by USDA and the space is safe to enter.

### ***Commodities Fumigated at Miami International Airport***

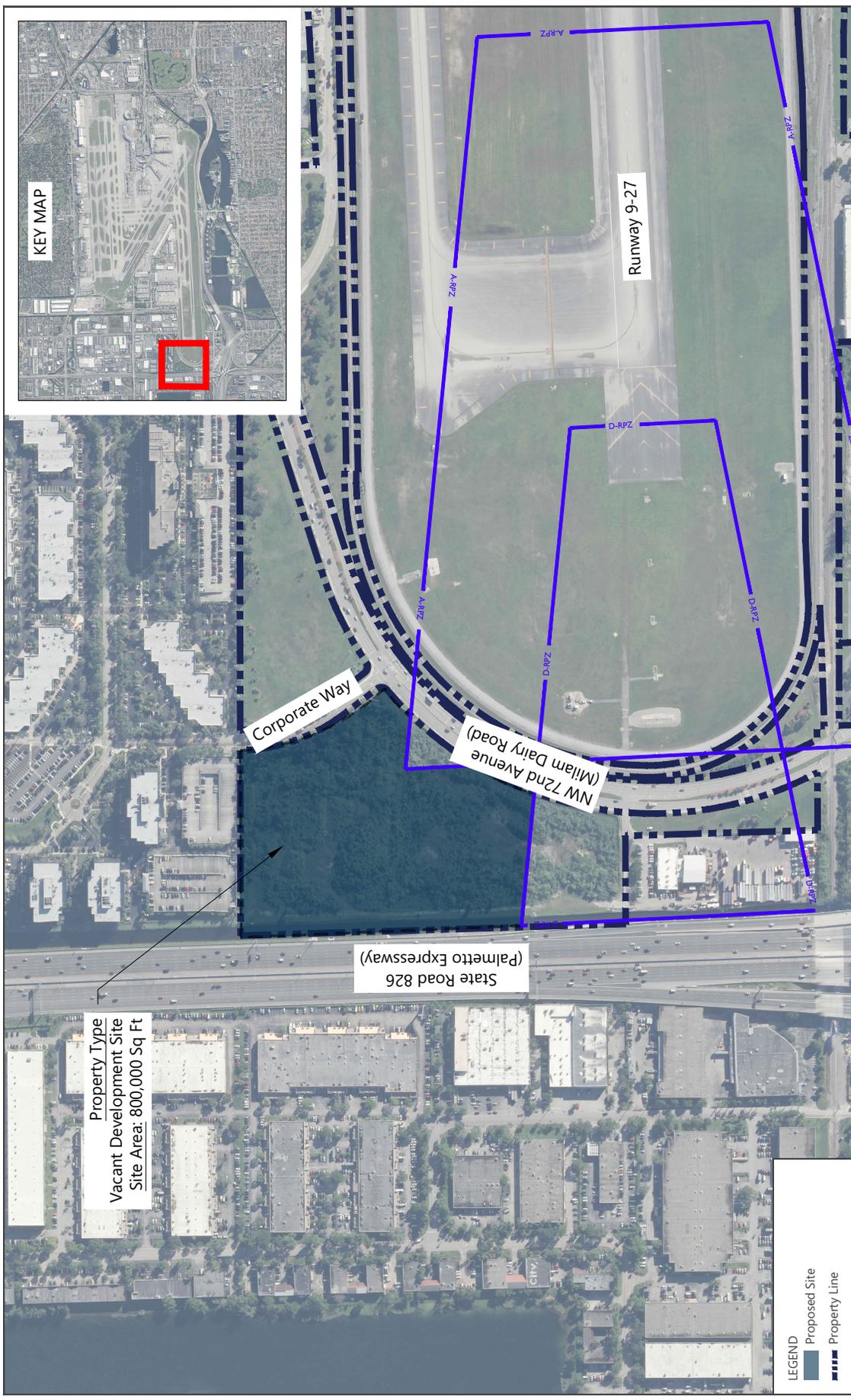
The most common commodities fumigated at MIA are fruits and vegetables (e.g., blueberries, asparagus), fish/seafood, and flowers. The procedures and treatment for such commodities are referenced in the USDA Treatment Manual shown in **Appendix A**.

## **2.3 STUDY OBJECTIVES**

The purpose of this Project Book is to solidify a conceptual layout and to establish the design criteria necessary to accommodate a new fumigation facility within a vacant parcel generally located west of NW 72nd Avenue, between NW 14th Street and Corporate Way (see **Exhibit 2-1**). Specifically, this study covers the following:

- assessment of existing surface and subsurface site conditions, including grades/elevations, geotechnical, and available utilities (drainage, water, sewer, electrical, communications, pollution control, gas, and jet fuel)
- identification of existing and/or anticipated environmental concerns
- assessment of existing fumigation operations at MIA and establishment of requirements for the new facility
- study of the feasibility for accommodating a new facility within the noted parcel, including proposed vehicle circulation, access, and building requirements
- identification of building requirements, including structural systems, power, communications, fire suppression, life safety systems, and any other necessary operating systems
- identification of civil and infrastructure requirements
- identification and development of a conceptual layout for building(s) and necessary civil infrastructure
- identification of required permits and standards
- provision of rough-order-of-magnitude (ROM) cost estimates to support the evaluation of the preferred concept

This Project Book is intended to be utilized by the architectural and/or engineering consultant (A/E Consultant), selected by MDAD, to undertake the final design of the noted facility. It is intended to provide general information and guidance for the preparation of design/construction contract documents, as necessary for MDAD to procure a construction contract to perform such work. The selected A/E Consultant shall verify and satisfy itself of all MDAD, federal, local, state, and other applicable standards necessary for the preparation of its design/contract documents. Final compliance with all applicable requirements rests with the A/E of Record.



SOURCES: Quantum Spatial, 2017 MIA Aerial Image, October 2017; Miami-Dade Aviation Department, Fumigation Facility Relocation and Test Cell Facility, March 2018.



**EXHIBIT 2-1**  
**FUMIGATION FACILITY RELOCATION**  
**PROPOSED SITE**



## 3. EXISTING CONDITIONS

### 3.1 OVERVIEW OF OPERATORS AT THE AIRPORT

MIA has two fumigation operators that provide service 24 hours a day, 7 days a week. The operators treat shipments originating from both air and sea routes:

- Termite Doctor: outdoor facility located at the east end of NW 25th Street
- Al-Flex: outdoor facility located north of NW 25th Street and west of 67th Avenue

### 3.2 INVENTORY OF EXISTING CONDITIONS

**Exhibit 3-1** depicts the current fumigation operators' existing sites. Additionally, data regarding the current fumigation facilities and the existing demand were collected and documented for each fumigator. The data were sourced from the following:

- site visit of Termite Doctor, including photographic inventory from on-site visits (refer to **Appendix B**)
- FY 2017 activity at MIA provided by the USDA

**Table 3-1** presents each fumigation operator's facility inventory.

TABLE 3-1 FUMIGATION FACILITIES – EXISTING CONDITIONS SUMMARY

FACILITY	TYPE OF FUMIGATION	TREATMENT USED	FUMIGATION SITE (SQ FT)	NUMBER OF TRACTOR-TRAILER / CONTAINERS POSITIONS	AVERAGE NUMBER OF TRACTOR-TRAILERS / CONTAINERS FUMIGATED PER DAY <sup>2</sup>	200-FOOT RADIUS BUFFER REQUIRED	ON-SITE MONITORING BY USDA
Termite Doctor	Tarpaulin/Tarpless	Methyl Bromide	150,000	15	17	Yes	Yes
Al-Flex (NW 67th Ave)	Tarpaulin/Tarpless	Methyl Bromide	100,000	20 <sup>1</sup>	40	Yes	Yes
<b>Overall Airport</b>	<b>Tarpaulin/Tarpless</b>	<b>Methyl Bromide</b>	<b>250,000</b>	<b>35</b>	<b>57</b>	<b>Yes</b>	<b>Yes</b>

NOTES: USDA – U.S. Department of Agriculture

1 Al-Flex's number of tractor-trailer/containers positions was assumed based on the daily average of tractor-trailers/containers fumigated and based on 2 fumigations per day.

2 The annual and monthly fumigation operations (FY 2017) were provided by the USDA, and the average daily number of containers fumigated was calculated based on the number of working days in December 2016 (peak month).

SOURCES: Termite Doctor, May 2018 (site visit); U.S. Department of Agriculture, *MIA Fumigation Facility - Data Request (Monthly Summary of Containers Fumigated at MIA)*, July 2018.



SOURCE: Quantum Spatial, 2017 MIA Aerial Image, October 2017.

**EXHIBIT 3-1**  
**FUMIGATION FACILITY RELOCATION**  
**EXISTING CONDITIONS**

Drawing: P:\Project-Miami\MDAD\On-call 2017\ISC6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits\_8,5x11.dwg; Layout: 3-1 Plotted: Jul 25, 2019, 02:31PM

## 4. FACILITY REQUIREMENTS

### 4.1 BENCHMARKING ASSESSMENT

Given the limited real estate available at MIA for new facility development, a benchmarking assessment of on-airport and off-airport enclosed fumigation facilities in the United States was undertaken to explore the feasibility of an enclosed solution, as well as to determine the layout standards. A total of three facilities were reviewed as part of the benchmarking assessment:

- On-Airport:
  - Gulfport-Biloxi International Airport (Mississippi)
- Off-Airport:
  - City of Miami (American Consolidation and Logistics [ACL])
  - Port of Baltimore (Wallenius Wilhelmsen Solutions)

**Appendix D** presents the detailed benchmarking assessment.

#### ***Key Findings from the Benchmarking Assessment***

Of the three facilities analyzed, ACL was chosen as the most relevant example of a state-of-the-art enclosed fumigation facility combined with refrigerated storage. It provides useful insight into the organization and size requirements of a modern fumigation facility.

The following recommendations for constructing and operating a fumigation facility are based on the findings from the benchmarking assessment:

- The facility's fumigation chamber shall include a gas recovery system that recaptures the fumigants during the ventilation phase.
- The facility shall combine palletized fumigation with full tractor-trailer/container fumigation.
- The facility shall include cold storage / refrigerated areas to store the commodities pre- and post-fumigation. In order to conduct cold treatments under USDA regulations, cold storage or refrigerated areas must be compliant with the certification requirements referenced in the latest version of the USDA Treatment Manual shown in Appendix A.

### 4.2 FACILITY REQUIREMENTS

#### 4.2.1 BASELINE REQUIREMENTS

Based on the FY 2017 activity summary provided by the USDA, AI-Flex and Termite Doctor currently fumigate 9,054 tractor-trailers/containers a year. Of those tractor-trailers/containers, 12 percent originate from the seaport. Due to the seasonality of the perishable commodities, the corresponding peak month is December. MIA fumigates an average of 57 tractor-trailers/containers daily during the month of December (working days only).

## 4.2.2 FUTURE REQUIREMENTS

Based on the 2017 Supplemental Aviation Activity Forecasts Update's cargo projections presented in **Table 4-1**, the cargo tonnage is expected to increase at a 3.4 percent compound annual growth rate (CAGR) between 2017 and 2035. As a result, the monthly peak number of containers fumigated will reach 2,321 containers by 2035.

To determine the corresponding total facility area required, the following assumptions were used:

- 90 percent of the tractor-trailers/containers (40-foot containers) could fit a maximum of 20 pallets, and 10 percent of the tractor-trailers/containers (53-foot containers) could fit a maximum of 25 pallets.
- The demand was increased by 20 percent to protect for induced demand resulting from a more modern and more efficient fumigation facility.
- The facility can fumigate up to twice a day.
- Each pallet (including circulation) requires 25 square feet of space.
- Based on the June 5, 2018, meeting with the current fumigation operators, fumigation can be assumed as 30 percent of the total facility.

TABLE 4-1 FUMIGATION FACILITY REQUIREMENTS

	CARGO TONNAGE	NUMBER OF CONTAINERS FUMIGATED IN THE PEAK MONTH <sup>1</sup>	AVERAGE DAILY NUMBER OF CONTAINERS FUMIGATED IN THE PEAK MONTH <sup>2</sup>	NUMBER OF CORRESPONDING PALLETS	FUMIGATION AREA (SQ FT) <sup>3</sup>	OTHER AREAS (SQ FT) <sup>3</sup>	TOTAL FACILITY (SQ FT) <sup>3</sup>
Existing (2017)	2,284,148	1,262	57	1,197	15,000 – 30,000	34,900 – 69,800	<b>50,000 – 100,000</b>
PAL 1 (2025)	3,086,863	1,706	78	1,638	20,500 – 41,000	47,800 – 95,600	<b>68,000 – 137,000</b>
PAL 2 (2030)	3,630,905	2,006	91	1,911	23,900 – 47,800	55,700 – 111,500	<b>80,000 – 159,000</b>
PAL 3 (2035)	4,201,033	2,321	106	2,226	27,800 – 55,700	64,900 – 129,900	<b>93,000 – 186,000</b>
<b>CAGR Existing – PAL 3</b>	<b>3.40%</b>						

NOTES: PAL – Planning Activity Level CAGR – Compound Annual Growth Rate

1 The annual and monthly fumigation operations (FY 2017) were provided by the USDA.

2 The average daily number of containers fumigated was calculated based on the number of working days in December 2016 (peak month).

3 The ranges' bottom and top values respectively correspond to one and two fumigation cycles per day.

SOURCES: U.S. Department of Agriculture, *MIA Fumigation Facility - Data Request (Monthly Summary of Containers Fumigated at MIA)*, July 2018; Miami-Dade Aviation Department, *2017 Supplemental Aviation Activity Forecast Update*, November 2017.

The final recommendation is to build one fumigation facility in two phases. Phase 1 and Phase 2 will respectively accommodate the 2025 and 2035 demand. As the demand not evenly distributed over the month with some days accommodating higher volumes, the averages of the 2025 and 2035 Total Facility Area ranges was used to plan the facility. The following building areas will apply:

- Phase 1: 104,000 S.F. (average of the 2025 Total Facility Area)
- Phase 2: 149,000 S.F. (average of the 2035 Total Facility Area)

## 5. CONCEPTUAL SITE PLAN

### 5.1 CONCEPTUAL LAYOUT

As depicted on **Exhibit 5-1** and **Exhibit 5-2**, the proposed site includes Phase 1 and Phase 2 of the proposed fumigation facility.<sup>1</sup>

Phase 2 full-buildout facility is approximately 195 feet wide by 795 feet long, with the long dimension oriented north-south. Truck access to the site is via Milam Dairy Road to NW 14th Street. On-site traffic circulation is organized around one-way vehicle movements to tractor-trailer/container parking positions on both the east and west sides of the building. All traffic exits the site from the northeast corner onto Milam Dairy Road.

**Exhibit 5-3** and **Exhibit 5-4** present renderings of the recommended fumigation facility.

### 5.2 BUILDING HEIGHT CONSIDERATIONS

The west side of the proposed building is largely used for staging areas; accordingly, the west side is the tallest part of the building. Based on the ACL drawings shown in **Appendix C**, the height of the building should be approximately 35 feet above finished floor (AFF), and the height of insulation ceiling panels within the building should be approximately 15 feet AFF in storage areas and 25 feet AFF in staging areas. The warehouse floor is raised to dock level (approximately 4 feet above grade). Therefore, the roof would be approximately 39 feet above grade (i.e., 35 feet + 4 feet = 39 feet; or approximately 46 feet above mean sea level [MSL]).

### 5.3 OPERATIONAL SCENARIOS

The proposed cargo processing model relies on a variety of operational scenarios.

#### 5.3.1 SCENARIO 1: FUMIGATION OF NONPERISHABLE CARGO

##### ***Scenario 1.1: Pallet Fumigation***

The tow vehicle and trailer back onto a westside elevated loading dock where the cargo is offloaded to a secure staging area and moved to a temperature- and humidity-controlled fumigation chamber suited to the cargo. Once the fumigation process is completed, the cargo is cleared by the USDA and returned to the staging area, reloaded into a tractor-trailer/container, and departs.

##### ***Scenario 1.2: Full Trailer Fumigation***

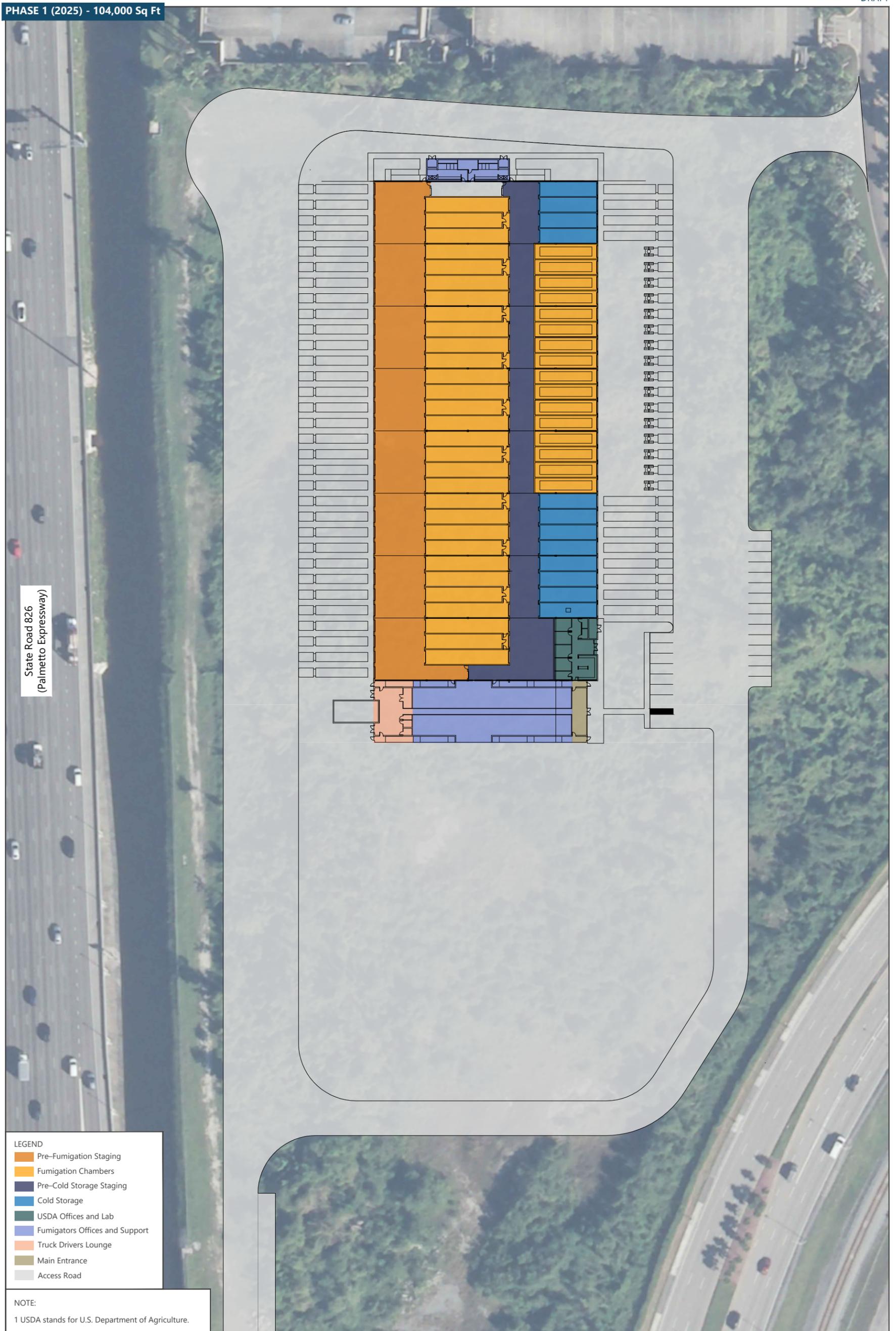
Alternatively, to fumigate within the tractor-trailer/container, the tow vehicle and trailer back into an eastside at-grade enclosed and fully insulated parking bay; the tow vehicle is disengaged, and the fumigant is introduced, following placement of monitoring devices. Each parking bay will fit up to four tractor-trailer/container at a time. Once the in-trailer/in-container fumigation process is completed and cleared by the USDA, the tow vehicle is reengaged and departs through the northeast exit onto Milam Dairy Road.

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<sup>1</sup> The designer will work with potential operators to determine the final layouts and space breakdown.



PHASE 1 (2025) - 104,000 Sq Ft



State Road 826  
(Palmetto Expressway)

LEGEND

- Pre-Fumigation Staging
- Fumigation Chambers
- Pre-Cold Storage Staging
- Cold Storage
- USDA Offices and Lab
- Fumigators Offices and Support
- Truck Drivers Lounge
- Main Entrance
- Access Road

NOTE:

1 USDA stands for U.S. Department of Agriculture.

SOURCE: □ quantum Spatial, 2017 MIA Aerial Image, October 2017 □ M C Harr □ Architects, Fumigation Facility Concept, November 2018.



EXHIBIT 5-1

FUMIGATION FACILITY RELOCATION  
PROPOSED CONCEPT (PHASE 1)

**FULL BUILDOUT (2035) - 149,000 Sq Ft**



State Road 826  
(Palmetto Expressway)

- LEGEND**
- Pre-Fumigation Staging
  - Fumigation Chambers
  - Pre-Cold Storage Staging
  - Cold Storage
  - USDA Offices and Lab
  - Fumigators Offices and Support
  - Truck Drivers Lounge
  - Main Entrance
  - Access Road

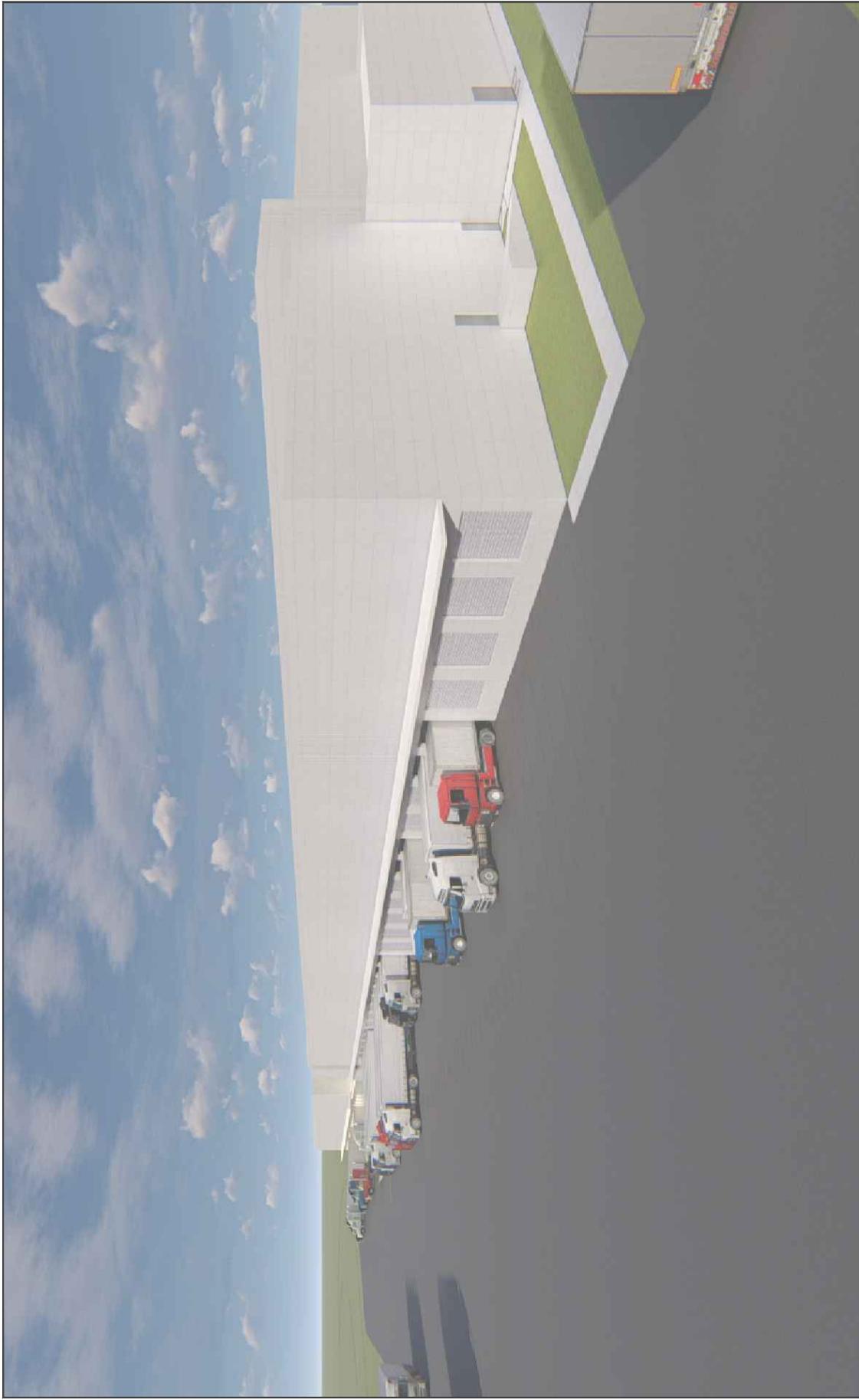
**NOTE:**  
1 USDA stands for U.S. Department of Agriculture.

SOURCE: □ uantum Spatial, 2017 MIA Aerial Image, October 2017 □ M C Harr □ Architects, Fumigation Facility Concept, November 2018.



**EXHIBIT 5-2**

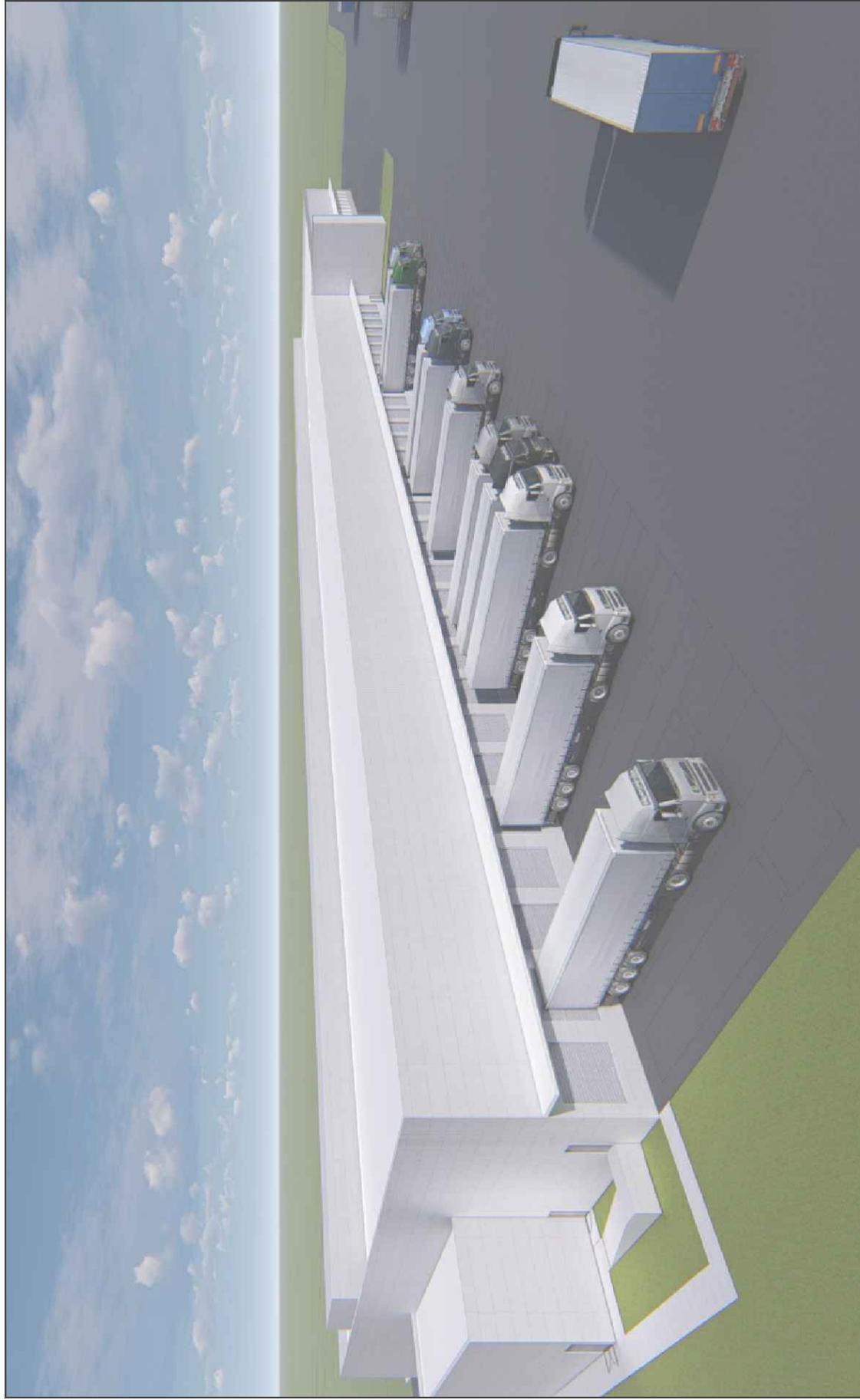
**FUMIGATION FACILITY RELOCATION  
PROPOSED CONCEPT (OVERALL)**



SOURCE: M C Harr Architects, *Fumigation Facility Massing Model*, December 2018.



**EXHIBIT 5-3**  
**PROPOSED FUMIGATION FACILITY MASSING MODEL**  
**VIEW FROM THE NORTHEAST**



SOURCE: M C Harrill Architects, *Fumigation Facility Massing Model*, December 2018.



0 Not To Scale

**EXHIBIT 5-4**  
**PROPOSED FUMIGATION FACILITY MASSING MODEL**  
**VIEW FROM THE NORTHWEST**

### 5.3.2 SCENARIO 2: FUMIGATION OF PERISHABLE CARGO

The tow vehicle and trailer back onto a westside elevated loading dock where the cargo is offloaded to a secure staging area and moved to a temperature- and humidity-controlled fumigation chamber suited to the cargo. Once the fumigation process is completed, the cargo is cleared by the USDA, resorted as necessary, and moved to a secure refrigerated storage unit with temperature settings appropriate for the product being stored. From there it is loaded into a refrigerated tractor-trailer/container on the eastside of the facility; the tractor-trailer/container exits to Milam Dairy Road for domestic distribution.

### 5.3.3 SCENARIO 3: STORAGE OF PERISHABLE CARGO

Vehicles and trailers transporting perishable cargo previously cleared by the USDA elsewhere can off load the product into a secure eastside temperature- and humidity-controlled storage room and held for a prescribed duration to increase shelf life. The cargo can be sorted, if needed, and loaded onto one or more refrigerated transport vehicles for delivery off-site via the northeast exit onto Milam Dairy Road.

## 5.4 AIRSPACE AND SAFETY AREA CONSIDERATIONS

Due to the location of the proposed fumigation facility, several airspace and runway safety areas need to be evaluated for penetrations. The proposed location may impact operations of Runway 9; therefore, a full airspace analysis should be performed before final design is completed. The analysis included below references the Code of Federal Regulations (CFR) Title 14 Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*; FAA's Order 8260.3D, *United States Standard for Terminal Instrument Procedures (TERPS)*; and Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design*.

Each of the referenced documents is used for different purposes by the FAA. The surfaces included in Part 77 are used to identify obstructions around the airport to ensure safe aviation of the surrounding airspace. A penetration to the Part 77 surface may be permissible as long as the object or structure is properly marked and lit. On the contrary, the surfaces included in the TERPS regulations are restrictive, and structure heights must not penetrate these surfaces to ensure there are no operational restrictions on the runway. If an object penetrates one of the TERPS surfaces, the instrument approach procedure for the runway will need to be changed to provide proper clearance to any obstacles. This is generally accomplished through lowering the visibility minimums for the runway.

Finally, AC 150/5300-13A provide guidance for Runway Protection Zone (RPZ) clearance, and the Threshold Siting Surface (TSS). In general, these are all expected to be kept free of obstructions but are not as restrictive as the TERPS surfaces.

### 5.4.1 TITLE 14 CODE OF FEDERAL REGULATIONS PART 77

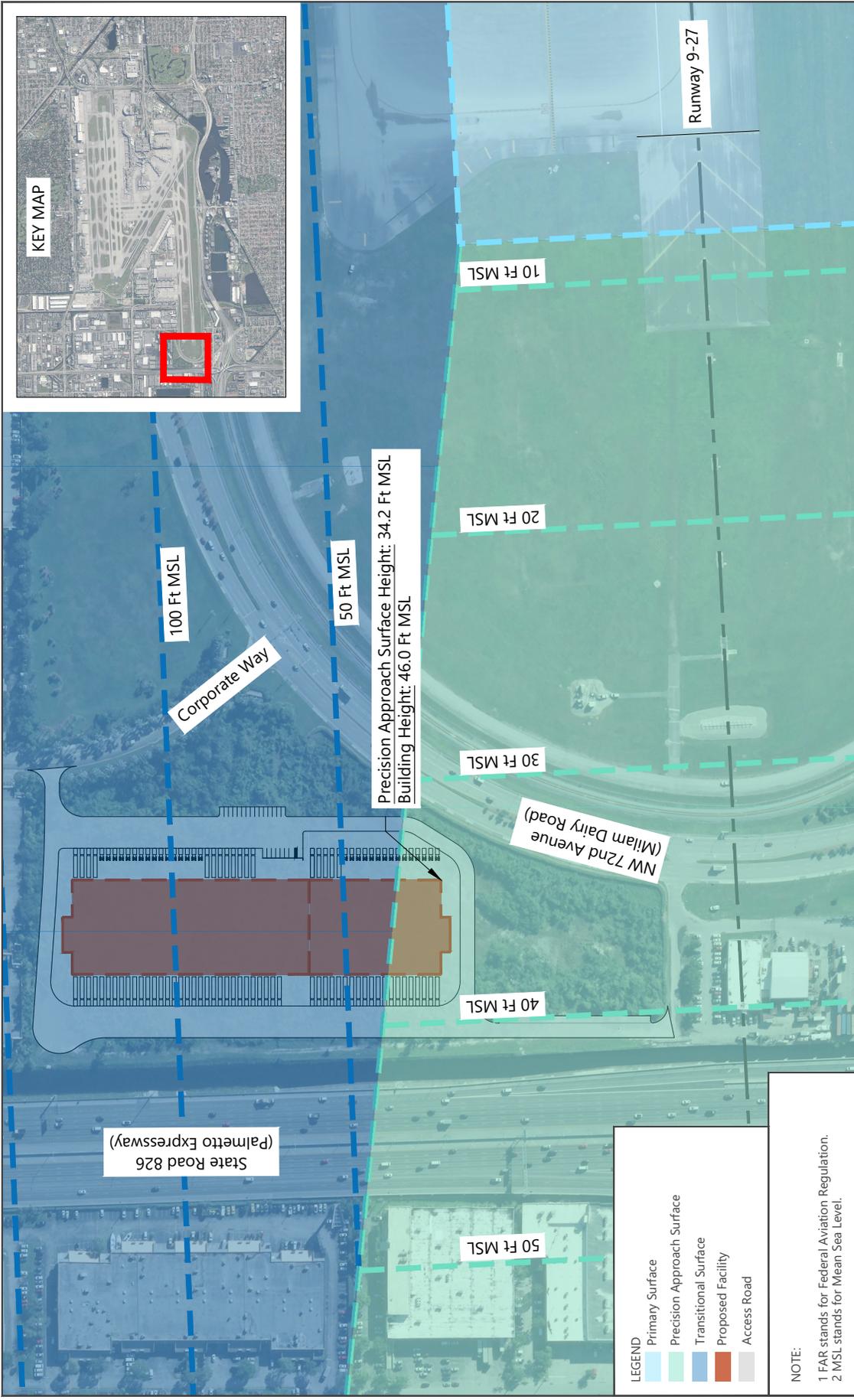
**Exhibit 5-5** depicts Title 14 CFR Part 77 imaginary surfaces near the proposed fumigation facility location.

#### ***Primary Surface***

The primary surface is longitudinally centered on the runway, extends 200 feet beyond the runway end and has the same elevation of the nearest point on the runway centerline. The primary surface is based on the Runway Safety Area and uniformly extends 500 feet from the runway centerline.

#### ***Precision Approach Surface***

The precision Approach surface begins at the end of the primary surface and extends outward and upward at a slope of 50:1 for the first 10,000 feet and at a slope of 40:1 for the next 40,000 feet.



KEY MAP

State Road 826  
(Palmetto Expressway)

Corporate Way

NW 72nd Avenue  
(Wiliam Dairy Road)

Runway 9-27

100 Ft MSL

50 Ft MSL

Precision Approach Surface Height: 34.2 Ft MSL  
Building Height: 46.0 Ft MSL

50 Ft MSL

40 Ft MSL

30 Ft MSL

20 Ft MSL

10 Ft MSL

- LEGEND
- Primary Surface
  - Precision Approach Surface
  - Transitional Surface
  - Proposed Facility
  - Access Road

NOTE:

- 1 FAR stands for Federal Aviation Regulation.
- 2 MSL stands for Mean Sea Level.

SOURCES: Quantum Spatial, 2017 MIA Aerial Image, October 2017; M C Harr Architects, Fumigation Facility Concept, November 2018.



**EXHIBIT 5-5**  
**FUMIGATION FACILITY RELOCATION**  
**FAR PART 77 SURFACES**

### **Transitional Surface**

The transitional surface extends outward and upward, perpendicular to the runway centerline from the edge of the primary and approach surfaces with a 7:1 slope.

As noted in Section 5.2, the height of the new would be 46 feet MSL which would directly penetrate a portion of the precision approach and transitional surfaces. Per Title 14 CFR Part 77, the Airport is required to notify the FAA of any new construction within the Part 77 surfaces in order to evaluate if the proposed construction is a hazard to air navigation. The FAA will determine appropriate mitigating measures (marking and lighting recommendations) using FAA's AC 70/7460-1, *Obstruction Marking and Lighting*, to preserve safety of air navigation.

## **5.4.2 TERMINAL INSTRUMENT PROCEDURES**

As described in FAA Order 8260.3B, TERPS approach and departure surfaces are applicable to Runway 9.

### **Instrument Landing System Approach Surfaces**

Runway 9 is equipped with precision instrument approach capabilities and as such is subject to TERPS final approach "W", "X" and "Y" Obstacle Clearance Surfaces (OCS). The "W" surface begins 200 feet from the landing threshold point and extends outward and upward at a slope of 34:1. The "X" surface extends outward and upward at a slope of 4:1 perpendicularly to the "W" surface. Similarly, the "Y" surface extends outward and upward at a slope of 7:1 perpendicularly to the "X" surface.

**Exhibit 5-6** shows that the proposed facility does not penetrate the TERPS approach surfaces.

### **Instrument Departure Surface**

The departure surface is centered on the runway, begins at the runway end and extends outward and upward at a slope of 40:1. As shown in **Exhibit 5-7** the proposed facility penetrates the departure surface. The overall climb gradient caused by the fumigation facility penetration is 201.6 feet per nautical mile and the "climb-to" altitude would be 49.8 feet above the departure-end of runway (DER). Per, FAA's Order 8260.46G, *Departure Procedure (DP) Program*, as the climb gradient is over 200 feet per nautical mile (standard) and the climb-to altitude is not greater than 200 feet above the DER, the fumigation facility will likely be considered a "low close-in". The Airport will need to coordinate with the FAA to determine whether modification of the instrument departure procedures would be required.

## **5.4.3 RUNWAY PROTECTION ZONES**

As defined in the FAA's AC 150/5300-13A, the RPZ is "an area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground." Therefore, the RPZ should remain clear of all above-ground objects or at least be cleared of all facilities associated with incompatible land uses defined in FAA's *Interim Guidance on Land Uses within a Runway Protection Zone*. A D-V approach reference code for Runway 9-27 requires the following approach and departure RPZ:

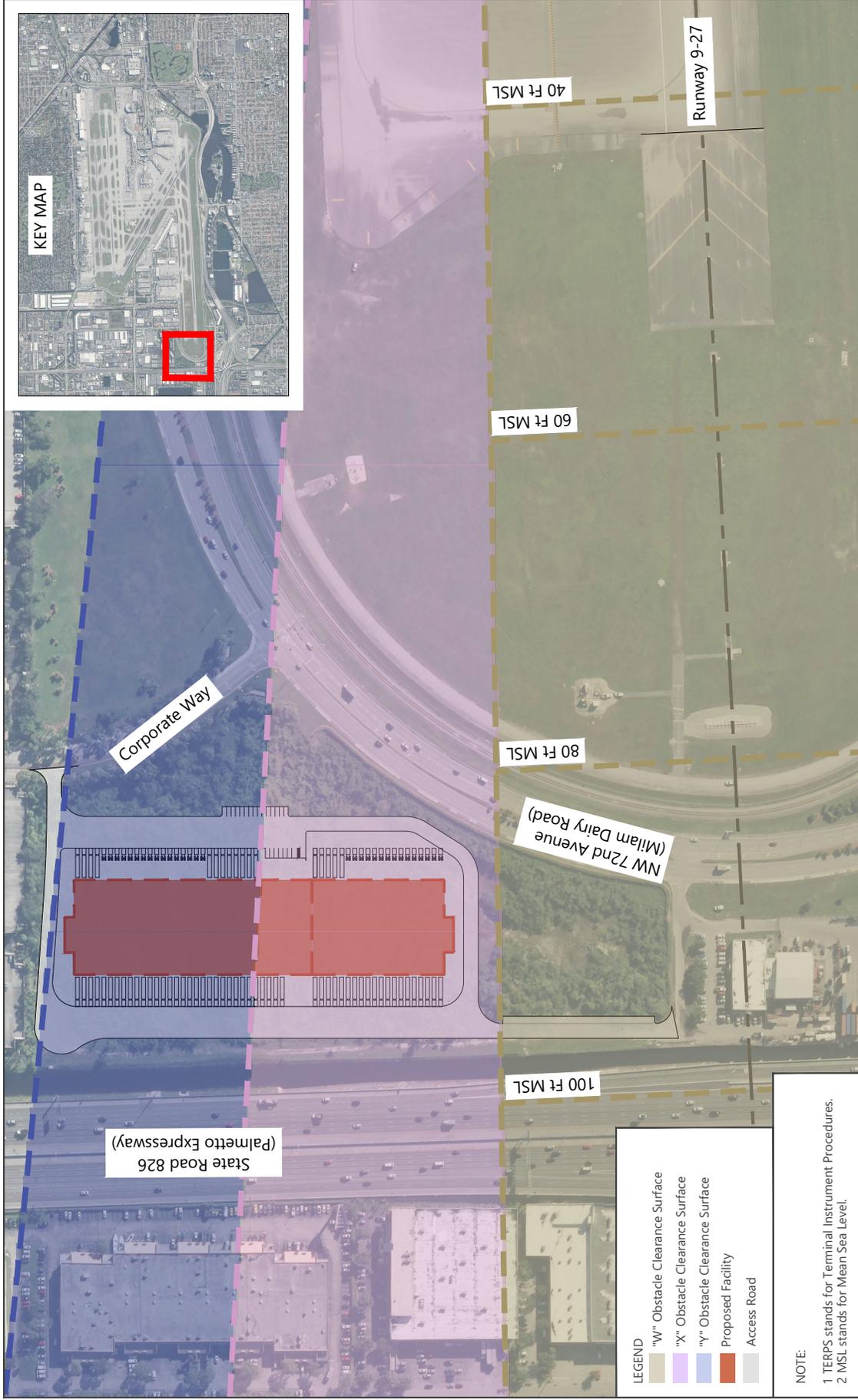
- Approach RPZ – 78.9 acres
- Departure RPZ – 29.5 acres

**Exhibit 5-8** shows that the proposed facility clears runway 9-27's approach and departure RPZs.

## **5.4.4 THRESHOLD SITTING SURFACE**

The TSS begins at runway 9 displaced threshold and extends outward and upward at a slope of 34:1.

**Exhibit 5-9** shows that there is no penetration to the TSS.

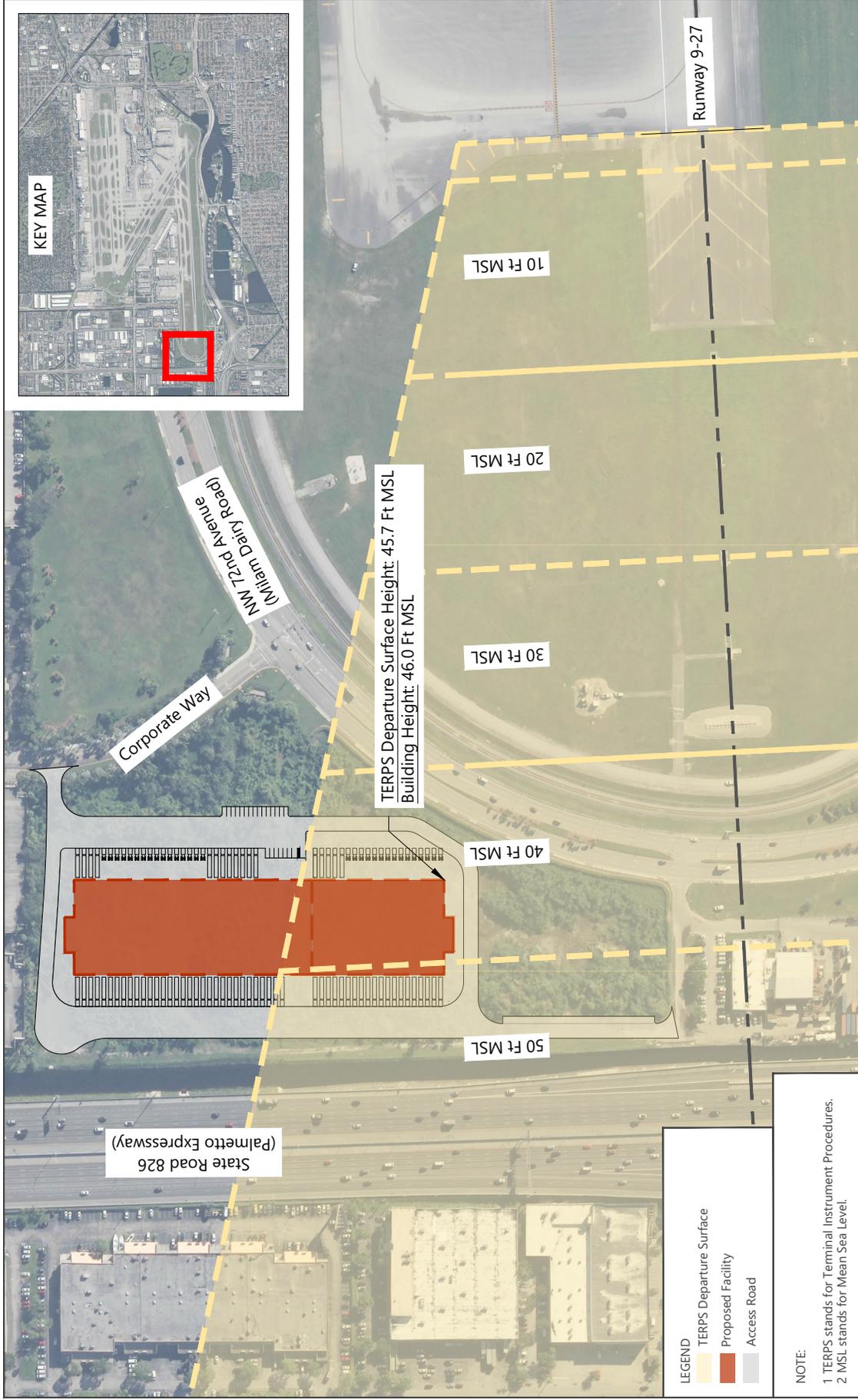


SOURCES: Quantum Spatial, 2017 MIA Aerial Image, October 2017; M C Hart Architects, Fumigation Facility Concept, November 2018.



**EXHIBIT 5-6**

FUMIGATION FACILITY RELOCATION  
TERPS APPROACH SURFACES



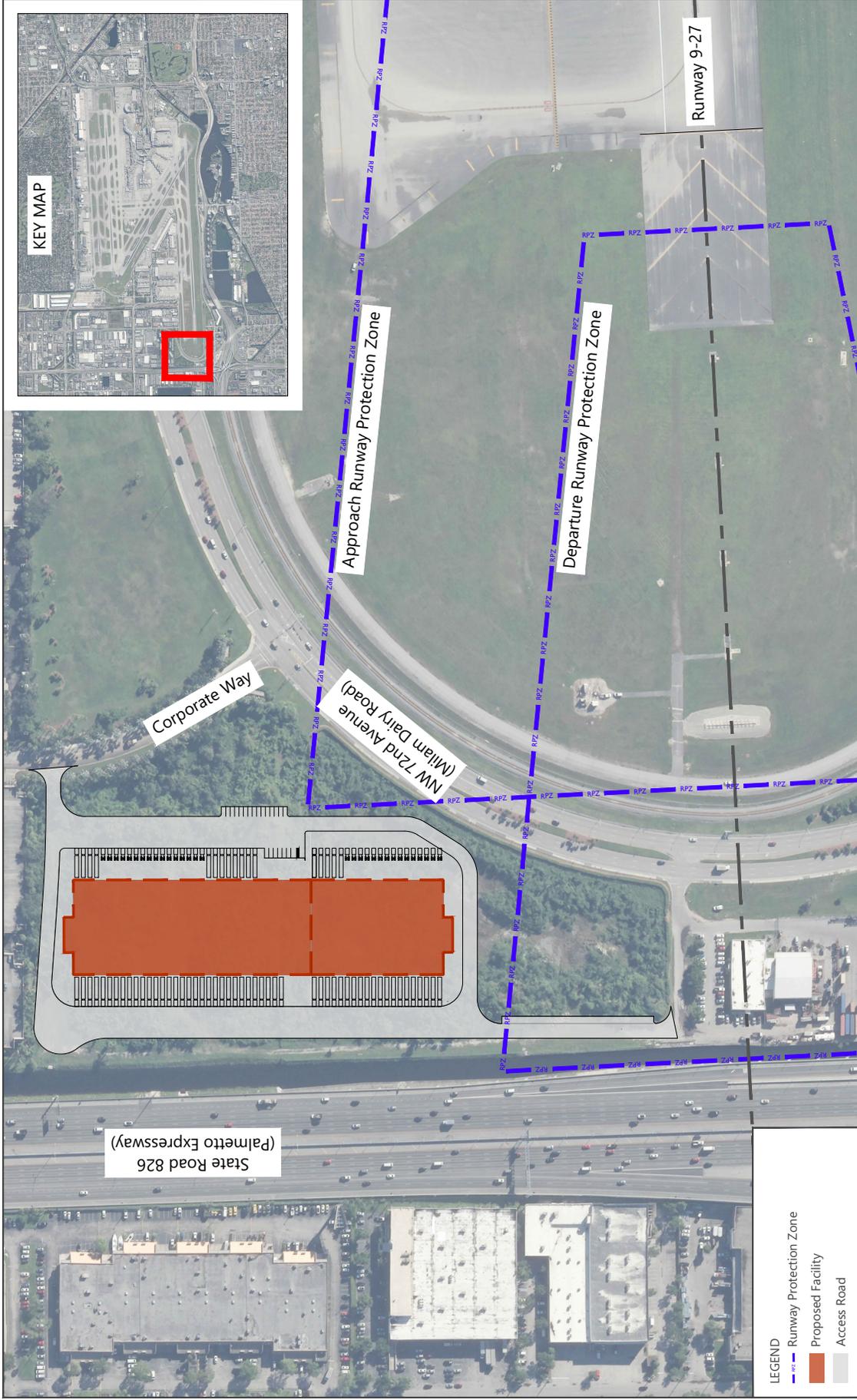
SOURCES: Quantum Spatial, 2017 MIA Aerial Image, October 2017; M C Harrell Architects, Fumigation Facility Concept, November 2018.



**EXHIBIT 5-7**

FUMIGATION FACILITY RELOCATION

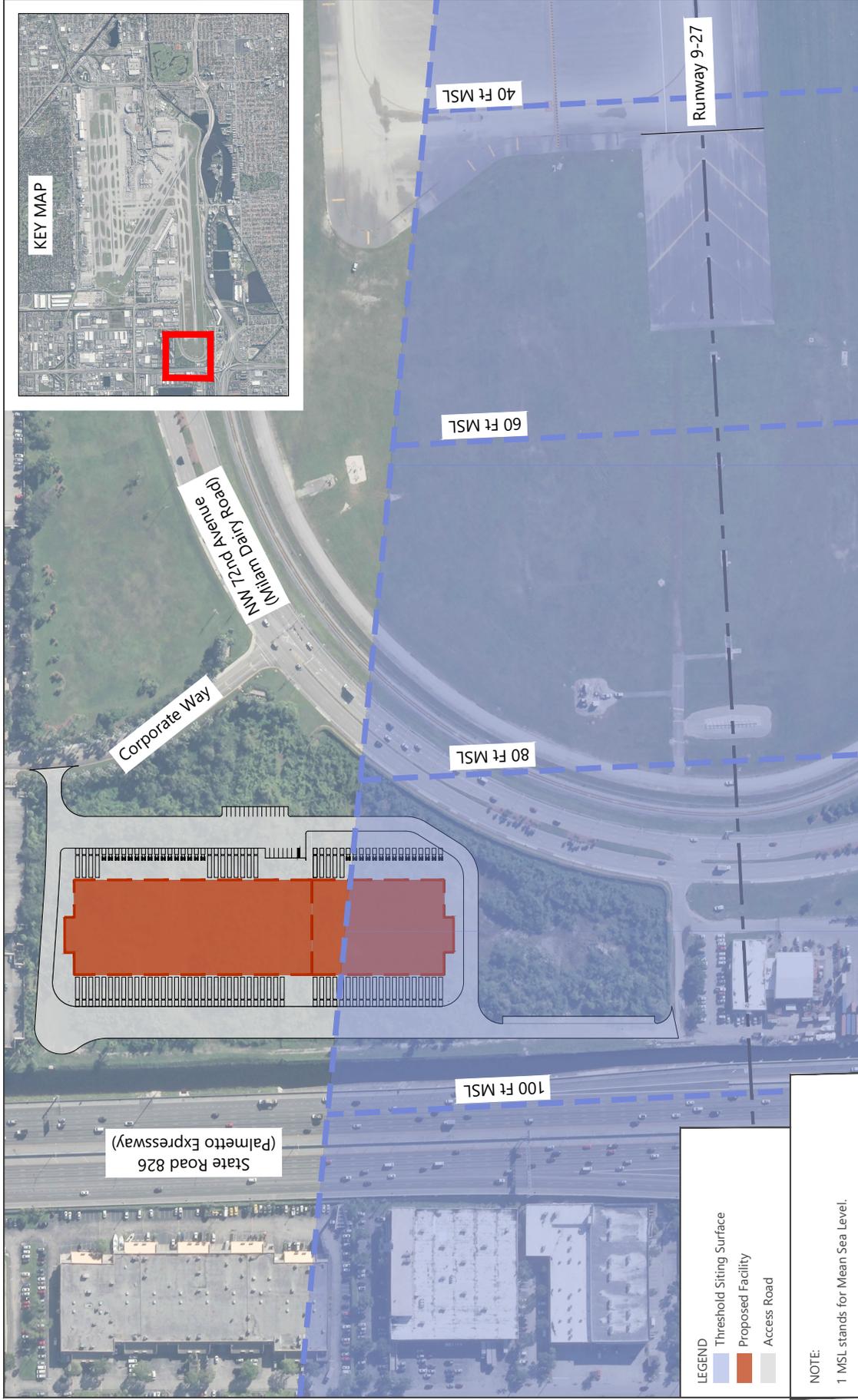
TERPS DEPARTURE SURFACES



SOURCES: Quantum Spatial, 2017 MIA Aerial Image, October 2017; M C Harrell Architects, Fumigation Facility Concept, November 2018.



**EXHIBIT 5-8**  
FUMIGATION FACILITY RELOCATION  
RUNWAY PROTECTION ZONES



SOURCES: Quantum Spatial, 2017 MIA Aerial Image, October 2017; M C Harrell Architects, Fumigation Facility Concept, November 2018.



**EXHIBIT 5-9**  
**FUMIGATION FACILITY RELOCATION**  
**THRESHOLD SITING SURFACE**



## 6. ARCHITECTURAL BUILDING CONCEPT

### 6.1 OVERVIEW

The proposed fumigation facility would be located on the west side of the Airport on undeveloped property immediately west-northwest of the south of Runway 9-27 and north of Northwest 14th Street.

### 6.2 BUILDING CONFIGURATION

To meet 2035 demand, the building's square footage will be approximately 149,000 square feet. The building will accommodate a total of 100 truck bays, each 16-feet wide; 52 bays on the westside; and 48 bays on the eastside. Truck bays are grouped to accommodate the operational scenarios:

- All 52 westside truck bays can accommodate Operational Scenarios 1.1 and 2, which is approximately equivalent to 104 containers per day, assuming a utilization rate of 2 fumigation cycles per day.
- 28 of the 48 eastside truck bays can accommodate Operational Scenario 1.2.
- 20 of the 48 eastside truck bays can accommodate Operational Scenario 3.

The 149,000-square-foot building floor plan also incorporates space for centrally located tenant offices, a truck driver lounge, an employee entrance, restrooms, and accessible access/egress ramps. Supplemental restrooms and egress ramps are located at each end of the building.

General guidelines for ceiling height within warehouse facilities include the following:

- When freight is not stored on multitiered racks, a 16-foot ceiling height should be adequate. Assuming 6 feet for roof structure and suspended insulation ceiling panels and allowing a 4-foot height for elevated loading docks, the building height in warehouse areas will be approximately 26 feet above grade; building height in office and restroom areas can be lower.
- When freight is stored on multitiered racks to accommodate high-volume distribution, a ceiling height of approximately 25 feet may be necessary. For the purposes of this study, a ceiling height of 25 feet has been incorporated into the concept design. Assuming 6 feet for roof structure and suspended insulation ceiling panels and allowing a 4-foot height for elevated loading docks, the building height in warehouse areas will be approximately 35 feet above grade.

### 6.3 ZONING CONSIDERATIONS

Per Miami Dade Property Appraiser, the project site is located within two parcels (Folio 30-3035-000-0072 and Folio 30-3035-000-090). Both parcels are currently owned by Miami Dade Aviation Department and classified as "Governmental Property" (GP) while the zoning district classification for adjacent parcels is "Governmental Property" (GP) or "Industrial" (IU).

Additionally, due to its proximity to MIA, additional airport zoning requirements are applicable. However, such requirements are largely based on height of structures and possible encroachment into the airport airspace surfaces (Part 77 and approach surfaces) adjacent to runways as described in section 5.4.

## 6.4 CONSTRUCTION CONSIDERATIONS

### 6.4.1 CONSTRUCTION PHASING

The proposed building has been configured for implementation in two phases as demand requires. The Phase 1 building area is approximately 104,000 square feet. However, this layout has only 32 westside truck bays, and it appears 39 truck bays may be needed to fumigate 78 containers per day (assuming 2 fumigations per day). If additional capacity is needed on the west side, trucks could get unloaded and then be pulled away and parked on the east side to allow another truck in.

As currently configured, the space allocation is as follows: 60 percent palletized fumigation (approximately 1,170 pallets), 21 percent full trailer fumigation (approximately 330 pallets), and 19 percent cold storage (approximately 216 pallets). Total fumigation capacity for palletized fumigation and full-trailer fumigation is equal to approximately 1,500 pallets.

The Phase 2 full-buildout building area is approximately 149,000 square feet. This layout shows 52 westside truck bays, approximately equivalent to 104 containers per day (assuming 2 fumigations per day). The 2035 requirements include 106 containers per day. At full buildout, the space allocation is as follows: 63 percent palletized fumigation (approximately 1,872 pallets), 19 percent full trailer fumigation (approximately 640 pallets), and 18 percent cold storage (approximately 351 pallets). Total fumigation capacity for palletized fumigation and full-trailer fumigation is equal to approximately 2,500 pallets. The ratios are estimates only; full-trailer fumigation and cold storage areas can be adjusted as necessary.

### 6.4.2 OCCUPANCY AND USE CLASSIFICATION

Low-hazard storage Group S-2 occupancies include buildings used for the storage of noncombustible materials, such as products on wood pallets or in paper cartons with or without single thickness divisions; or products in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles, or film wrapping. Group S-2 storage uses shall include storage of the following: dairy products in non-waxed coated paper containers; food products; foods in noncombustible containers; fresh fruits and vegetables in non-plastic trays or containers; frozen foods; and meats. For additional information, refer to Florida Building Code (FBC)-B §311.3.

### 6.4.3 TYPE OF CONSTRUCTION

The type of construction has been identified as Type II-B, noncombustible (no fire-resistance rating required for roof or exterior walls). For purposes of this analysis, the type of construction is based on Phase 1 development of a single-story building of less than 104,000 square feet in area, equipped throughout with an automatic fire-suppression sprinkler system:

- Maximum Allowable Building Height for Type II-B (based on Group S-2, one story in height, fully sprinklered): 75 feet (per FBC-B Table 504.3).
- Maximum Allowable Building Area for Type II-B (based on Group S-2, one story in height, fully sprinklered): 104,000 square feet (per FBC-B Table 506.2).<sup>2</sup>

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<sup>2</sup> If Phase 1 development is increased to more than 104,000 square feet, then it must comply with requirements for Type II-A or Type I-B construction (e.g., minimum 1-hour fire-resistance rating for primary structural frame, exterior walls, and roof construction). Also, if/when Phase 2 is constructed, the building area will exceed 104,000 square feet; therefore, a fire wall will be required for separation between Phase 1 and Phase 2.

## 7. STRUCTURAL BUILDING CONCEPT

### 7.1 MECHANICAL

The entire facility shall be provided with an energy-efficient heating, ventilation, and air conditioning (HVAC) system to provide individual control throughout all occupied areas using variable air volume (VAV) boxes or dedicated air-conditioning units. Office spaces shall be designed to maintain an indoor target temperature of 75-degrees Fahrenheit with a 50 percent ( $\pm 5$  percent) relative humidity. Specific bay area housing refrigerated goods shall be designed for interior temperatures in accordance with the type of goods that will be stored. Care should be taken when selecting the HVAC equipment, including a consideration for noise-generated characteristics. Outside air temperature shall be based on Miami-Dade County (MDC) typical summer and winter conditions. The following codes and standards shall be adhered to for the mechanical design of this project:

- Florida Building Code
- Florida Fire Prevention Code
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): 60.1-2013, Ventilation for Acceptable Indoor Air Quality
- Sheet Metal and Air Conditioning Contractors' National Association: Ductwork Construction Standards
- National Fire Protection Association (NFPA)

Based on preliminary space planning and preliminary cooling load estimates, the following values are projected to accommodate the needs for the new fumigation facility:

- Office Space: 100 tons
- Refrigerated Space: 800 tons

#### ***Air-Handling Units***

All air-handling units serving the office space should be installed on the roof (rooftop units) or in mechanical rooms located within the building. These air-handling units shall be the double wall type with enclosed motors and a variable frequency drive system. They shall modulate air flow to a system of pressure-independent VAV boxes. All boxes shall be thermostatically controlled. All boxes serving occupied areas shall be provided with electric heat capabilities.

Thermostats for localized control shall be wall mounted. To eliminate any possible indoor air quality problems (above and beyond constantly monitoring the amounts of pre-cooled outside air, carbon dioxide levels in the return air, and the indoor humidity levels, as directed by ASHRAE 62.1-2013, Guideline, and the ASHRAE-issued *Humidity Control Design Guide*), all ductwork shall be galvanized sheet metal with complete externally wrapped insulation. The insulation R-value will be specified to meet or exceed the requirements of the Florida Energy Efficiency Code for Building Construction. This should provide for a clean, smooth air flow track throughout the life of the system. Additionally, the ductwork system will be designed with provision for sound transmission dampening devices (sound attenuators) to eliminate noise carryover and transmission through ductwork pipes. The selection and location of sound attenuation devices will be based on preventing air noise impingement on occupied environments.

The air-conditioning system's return air will be completely ducted into respective air-handling units. This will allow for a better air control of the overall air-conditioning system, while reducing the chances of untreated outdoor air being introduced into the building through minuscule cracks in the perimeter walls at points above the ceiling line.

All ducts crossing over rated partitions will be provided with a damper matching the rating of the partition being crossed. If a partition is smoke rated, then a smoke damper will be provided. The same applies to fire-rated or fire/smoke-rated partitions.

The air-handling units will be provided with direct expansion cooling coils. In instances where the air-handling units are serving a VAV system, the compressors serving these specific units will be specified of the digital type with both hot-gas bypass and reheat coil capabilities. This will allow personnel to accurately control indoor air quality (temperature and relative humidity) at partial cooling load scenarios.

### ***Ventilation***

The building toilet rooms and janitorial closets will be provided with adequate ventilation. Toilet rooms and janitorial closets will be ventilated meeting or exceeding the volumetric rates required by the Florida Building Code. All related ductwork to this ventilation system will be made of sheet metal and will be externally insulated. In isolated cases, where single toilet rooms or janitorial closets are away from a main ventilation trunk duct, ceiling-cabinet fan types will be provided to properly ventilate these areas.

An exhaust ventilation system, capable of removing fumigation gases from the facility while replacing with uncontaminated fresh air, will be designed in accordance with the facility operating requirements.

### ***Controls***

A state-of-the-art direct-digital-control system will be provided to properly control and monitor all the mechanical devices to be controlled and/or monitored (e.g., condensing units, VAV boxes, air-handling units, exhaust fans, supply fans, fan coil units, refrigeration equipment).

This control system will be designed so it can be accessed from a central location (to be determined) and/or accessed remotely through a web-based system. All appropriate passwords will be provided to the appropriate personnel by the control equipment supplier. Additionally, the control program will be specified so all applicable, adjustable variables (e.g., individual space temperatures, time schedules) can be easily modified to custom-fit the user requirements. All control wires will be specified of the plenum-rated type and will be installed in a minimum of 0.5-inch conduits.

## **7.2 ELECTRICAL**

### ***Building Electrical Distribution***

This new refrigerated fumigation facility will require an estimated 4,000 amps, 120/208 volts, three-phase, four-wire electrical service. This service will be served directly from a new Florida Power & Light (FPL) transformer in the northeast corner of the site. The service entrance equipment and corresponding panelboards serving the facility will be housed in a dedicated electrical room(s) located on the perimeter of the building.

This facility will be 100 percent backed up by a proposed backup diesel generator estimated at 1,250 kilowatts located inside the building in a new generator room. The generator will be provided with an 8,000-gallon (72 hours of fuel as requested by MDC) aboveground double-wall diesel fuel tank located on the exterior of the building.

The following is a list of equipment that will be connected to the emergency power distribution system:

- emergency lighting
- fire alarm system
- generator auxiliaries
- fire protection equipment
- security screening equipment
- telephone/security systems
- mechanical control systems
- building automation system
- uninterruptible power supply (UPS)
- air conditioning equipment for IT room
- other equipment or lighting designated by the MDC/users

This facility will be provided with a 100-kilovolt-ampere UPS system for the central IT / server room to maintain operational continuity of critical systems during the switchover period after a normal power failure to generator power. The proposed single-module UPS will have maintenance-free sealed batteries in cabinets, static switch, and a maintenance bypass cabinet. The UPS system will be connected to all control-room critical electronic loads, communications equipment, and select PC workstations to be defined by the user. It is assumed that noncritical electronic equipment will have standalone UPS units.

### ***Lighting Systems***

Lighting levels will be designed utilizing the FBC. All lighting fixtures will be energy-efficient LED lamp source. The proposed lighting system will be as follows:

- Office areas will generally have LED troffers with one fixture for every 80 square feet in large and open office areas and two fixtures minimum for smaller (8 feet by 10 feet) offices. All fixtures will have provisions for two lighting levels.
- Storage/Refrigeration/Fumigation areas will have LED troffers hung from the structure, with one fixture for every 100 square feet.
- All exterior lighting will be LED wall security packs to maintain the overall look of the exterior of the facility. Lighting in parking areas will be pole mounted LED fixtures. Exterior lighting and associated parking areas will be designed to be in conformance with Miami-Dade Code Section 8C-3 and all light poles will meet the applicable FAA regulations.
- Exit lights will be LED edge-lit type in all areas.

### ***Lightning Protection System***

The facility will be designed with an Underwriters Laboratories (UL) master-labeled lightning protection system per NFPA 780 and Lightning Protection Institute 175 Standards. Surge protection will be provided on the main electrical service equipment and all panelboards serving office areas, IT rooms, and communications equipment.

### **Fire Alarm**

The building's life safety components will be monitored by a fire alarm detection and annunciation system. A microprocessor-based fully addressable intelligent system will be designed to provide an early warning network throughout the building in the event of a fire condition. This system will consist of smoke detectors, heat detectors, duct smoke detectors, and manual pull stations. Americans with Disabilities Act (ADA)-approved automatic audible and visual alarm signals will be provided to guarantee the notification to all building occupants. Fire alarm system functions will be as follows:

- alarm initiating and signaling
- Emergency Voice Communications (recorded message/speaker system)
- fire department communications (fireman's phone system)

The main fire alarm panel will be housed in the main office area with a graphic annunciator panel at the entrance lobby to the building.

### **Access control and Closed-Circuit Television Systems**

The facility will have access control and security systems to monitor the entrance and exit of all employees into the facility, as well as to control access to the more vital rooms within the building. Card readers and right-to-exit devices will be installed on all entrance/exit points and on all critical/vital room access points. The closed-circuit television (CCTV) will consist of IP cameras with a minimum of 1,080-pixel resolution. Cameras shall be installed at all exits and all exterior corners of the building, as well as in interior spaces deemed critical by the user.

## **7.3 PLUMBING**

The facility will be provided with a complete plumbing system that will consist of a sanitary collection and disposal system, a storm drainage system, and a domestic water distribution system, including distribution of hot water.

### **Domestic Water Distribution**

Domestic water service will be provided by connecting into the existing main water system serving the area. The main line feeding the building will be split for the fire protection component and for domestic water service, each with its own backflow preventer. Adequate isolation valves will be provided at each branch to facilitate building maintenance without having an overall building water shutdown. Hot water will be provided at all applicable fixtures within the building. All domestic water lines (hot and cold) will be of the copper type. Keyed wall hydrants will be provided throughout the perimeter of each building, spaced at no more than 100 feet from each other.

### **Sanitary Drainage System**

The sanitary system will consist of a waste and vent collecting system, which will be discharging into the underground sanitary sewer mains. Adequate cleanouts will be provided, as required by the FBC, to facilitate the maintenance of the overall sanitary system. All sanitary waste and vent lines will be of the cast-iron type. Aboveground applications shall be installed using hub-less fittings, and underground application shall be installed using hub-and-spigot fittings. All toilet rooms shall be provided with low-flow tankless toilet fixtures and low-flow flushometer urinals to conserve water. These urinals could significantly reduce the water demand in the new building. All toilet rooms shall be provided with floor drains and keyed wall hydrants for cleaning purposes.

### ***Storm Drainage System***

The storm drainage system shall collect roof runoffs through drains that will have leaders down to a collection system surrounding the building. The collection system and subsequent disposal structures will be provided under the civil engineering component of this project. All storm drainage lines within the building will be of the insulated hub-less cast-iron type. Insulation on these lines is required for sound isolation purposes.

### ***Plumbing Fixtures***

Plumbing fixtures shall be commercial grade. Accessible fixtures shall be provided as specified by the Uniform Federal Accessibility Standards. Water closets shall be wall mounted, vitreous china with flush-valve operation designed for 1.280 gallons per flush. Urinals shall be wall mounted, vitreous china with flush-valve operation designed for 0.125 gallons per flush. Lavatories shall be vitreous china, countertop drop-in type or wall-hung fixture with ADA-approved trim and/or single-handle type faucet with 0.5 gallons per minute (gpm) discharge. Electric water coolers shall be hi-lo type, wall-mounted self-contained units. Water heaters, when supplied, will be of the instantaneous type. Mop sinks shall be floor-mounted cast stone units with stainless steel wall-mounted splashguards and a wall-mounted faucet set.

## **7.4 FIRE PROTECTION OVERVIEW**

A properly zoned, supervised, hydraulically designed fire protection system consisting of an automatic fire sprinkler system and standpipes shall be provided utilizing the following MDAD design criteria:

### ***Reference Standards***

- NFPA 13 – 2013 Edition: Installation of Sprinkler Systems
- NFPA 14 – 2000 Edition: Installation of Standpipe, Private Hydrant, and Hose Systems
- NFPA 20 – 2013 Edition: Installation of Stationary Pumps for Fire Protection

All office and assembly areas will be designed as follows:

- Occupancy: Light Hazard Flow
- Density: 0.10 gpm/square feet over the hydraulically most-remote 1,500 square feet of area
- Area Coverage: 225 square feet maximum per sprinkler head
- Proposed Sprinkler Head Types: standard upright or pendant in exposed areas; semi-recessed in hard or acoustical ceilings; sidewall type where applicable

All warehouse areas (miscellaneous storage up to 12 feet in height) will be designed as follows:

- Occupancy: Ordinary Hazard Group 1
- Flow Density: 0.15 gpm/square feet over hydraulically most-remote 1,500 square feet of area
- Area Coverage: 225 square feet maximum per sprinkler head
- Proposed Sprinkler Head Types: standard upright or pendant in exposed areas

In warehouse areas subjected to freezing temperatures (i.e., coolers), a dry pipe system will be provided in accordance with NFPA 13 requirements.

All telecommunication rooms, including the main IT room, will be protected by a dry-gas type (Inergen) fire protection system, which does not require human evacuations of rooms and is environmentally friendly (i.e., not containing chlorofluorocarbons or hydrochlorofluorocarbons). This eliminates the presence of water in these vital rooms, thus preventing possible water damage to the telecommunication and IT equipment.

All materials and equipment, including piping (Schedule 40 black steel in sizes 2.0 inches and smaller; Schedule 10 in sizes 2.5 inches and larger) shall be UL-listed and FM-approved.

A hose allowance of 100 gpm for light hazard occupancies will be added to the sprinkler demand. It will be compared to data provided by a required fire-flow test to assure adequate flow and pressure are available to protect the building, its contents, and its occupants.

The fire protection system shall be provided with a driven fire pump sized to properly provide the amount of water required by the number of standpipes. It will also be sized to achieve a required pressure of 100 pounds per square inch at the highest roof manifold. The specification of the fire pump shall be made in strict accordance with Chapter 20 of the NFPA. This pump shall be sized per hydraulic calculations of the design using the water-flow test data from the area's water source as a reference point.

## 7.5 STRUCTURAL ENGINEERING OVERVIEW

The structural framing for this one-story facility is a concrete tilt-up building with interior steel framing. Four bays are in the east–west direction, and in the north–south direction the columns are spaced to accommodate truck traffic. The exterior tilt-up walls have openings that span about 32 feet to provide two lanes of truck access. Steel roll-up doors are required to close the truck entrances during storm conditions.

The interior framing consists of steel columns and steel beams or open-web steel joists at 5 feet on center supporting a steel roof deck, with rigid insulation or light-weight insulating concrete.

At the elevated loading dock areas there is a 4-foot change in elevation to facilitate container unloading. The other areas, including offices and restrooms, are at a lower elevation closer to the existing grades.

A geotechnical investigation shall be required. However, it is anticipated that shallow foundations will be required.

## 7.6 SITE UTILITIES OVERVIEW

The Consultant Team coordinated with Sunshine State One Call of Florida, Inc., to open a design ticket to obtain pertinent information for the utilities present within the proposed facility area. These utilities include power, telecommunication, gas, water, sewer, and other identified facilities. Refer to **Appendix E** for additional information.

While utility coordination was performed within the area, the A/E Consultant must continue these efforts and must continue to communicate with the utility providers for the most up-to-date information.

### 7.6.1 SEWER SERVICE

#### 7.6.1.1 EXISTING CONDITIONS

A 48-inch force main runs along NW 72nd Avenue (Milam Dairy Road) along the southeast boundary of the proposed facility site. North of the proposed site is a 10-inch gravity sewer along NW 19th Street, which ultimately connects to Pump Station 19 (PS-19), located east of NW 70th Avenue, via a 36-inch gravity sewer along NW 22nd

Street. Existing sewer lines and force mains can be found via the Miami-Dade Water and Sewer Department Sewer Atlas, as provided in **Appendix F**, Sheets N13 and N13.5.

### 7.6.1.2 DESIGN REQUIREMENTS

Sewer service for the new facility shall be provided through a connection to the existing sanitary sewer collection system located along NW 19th Street via existing Manhole 33 (MH-33) at the intersection of NW 75th Avenue and NW 19th Street. The A/E Consultant shall be responsible for designing the sanitary sewer conveyance for the proposed fumigation facility and for the connection to the existing sanitary sewer collection system, so it meets the requirements of all agencies having jurisdiction over the project. The A/E Consultant shall evaluate how to collect and convey all sanitary flows from the proposed facility to the point of connection to the existing system. The A/E Consultant shall be responsible for determining the capacity requirements for the service connection to the proposed facility, considering average, minimum, and peak flow. The new sanitary sewer collection system shall be adequately sized and routed and shall not adversely impact the existing receiving system under peak-flow conditions.

The concept for the proposed sanitary sewer collection system consists of a new gravity sewer serving the facility, which connects to a grinder pump package system, a force main, a double-check valve assembly, or any other means necessary to appropriately convey demand flows.

Anticipated sewer demand flows have been estimated per the MDC Code of Ordinances Section 24.43-1, Liquid Waste Disposal and Potable Water Supply Systems. **Table 7-1** lists the total anticipated sewage flow. Based on facility square footage, the estimated sewage demand flow of 3,315 gallons per day (gpd; 2.3 gpm) will need to be accommodated.

**TABLE 7-1 ESTIMATED FLOW DISTRIBUTION PER MIAMI-DADE COUNTY ORDINANCE SECTION 24.43-1 BASED ON FACILITY SQUARE FOOTAGE**

LAND USE PER MDC ORDINANCE SEC. 24.43-1	SEWAGE FLOW PER MDC ORDINANCE SEC. 24.43-1 (GPD/100 SQ FT)	PROPOSED FACILITY AREA (SQ FT)	ESTIMATED SEWAGE DEMAND FLOW (GPD)
Fumigation Facility (TOTAL = 149,000 square feet)			
Warehouse / Spec. Building	2	138,737	2,774.74
Office Building	5	10,800	540.00
<b>TOTAL</b>			<b>3,314.74</b>

NOTE: GPD – Gallons Per Day

SOURCE: Miami-Dade County, Miami-Dade County Ordinance Section 24.43-1, 1992.

Due to the exclusivity of a fumigation/refrigeration facility, the facility land use was identified as part "Warehouse/Spec. Bldg.," and the bathrooms were identified as "Office Building," per the Ordinance to approximate potential sewage demand flows. It is anticipated that the existing 10-inch gravity sewer for the proposed connection can provide sufficient capacity for the anticipated sewage flows, given that connecting to the existing 10-inch gravity main at MH-33 along NW 19th Street will bring the sewage to PS-19, which currently has a nominal average pump operation time (NAPOT) of 1.97, with a projected NAPOT of 2.02.

### 7.6.1.3 RECOMMENDATION

A recommended solution is to provide a grinder pump to receive sewage flow from the eastern façade of the facility, near the proposed tenant offices and restrooms, which are located near the center of the facility, via a 4-inch service weight cast-iron gravity main. Supplemental restrooms located at the north and south ends of the facility will also generate sewage to be received by the same grinder pump via 4-inch cast-iron gravity mains. Sewage shall be pumped through a proposed 2-inch ductile iron (DI) force main via a grinder pump with appropriate specifications, as determined by the A/E Consultant. The main will be located on the east side of the facility. It is estimated that 0.5 horsepower will be sufficient for the proposed flow; however, the A/E Consultant shall be responsible for selecting an adequate grinder pump with sufficient power and pressure capacity for anticipated peak flow. It is worth noting that a Sewer Capacity Certification (Allocation Letter) will be required for connecting to an existing sewer system, in order to certify that the sewer system can handle the demands of the new facility.

The 2-inch DI force main is proposed for connection from the proposed grinder pump to the existing 10-inch gravity sewer main via MH-33, located north of the site, along NW 19th Street. At the property line, the proposed 2-inch DI force main shall be equipped with a double-check valve assembly.

**Exhibit 7-1** provides a schematic of the proposed configuration.

## 7.6.2 WATER SUPPLY

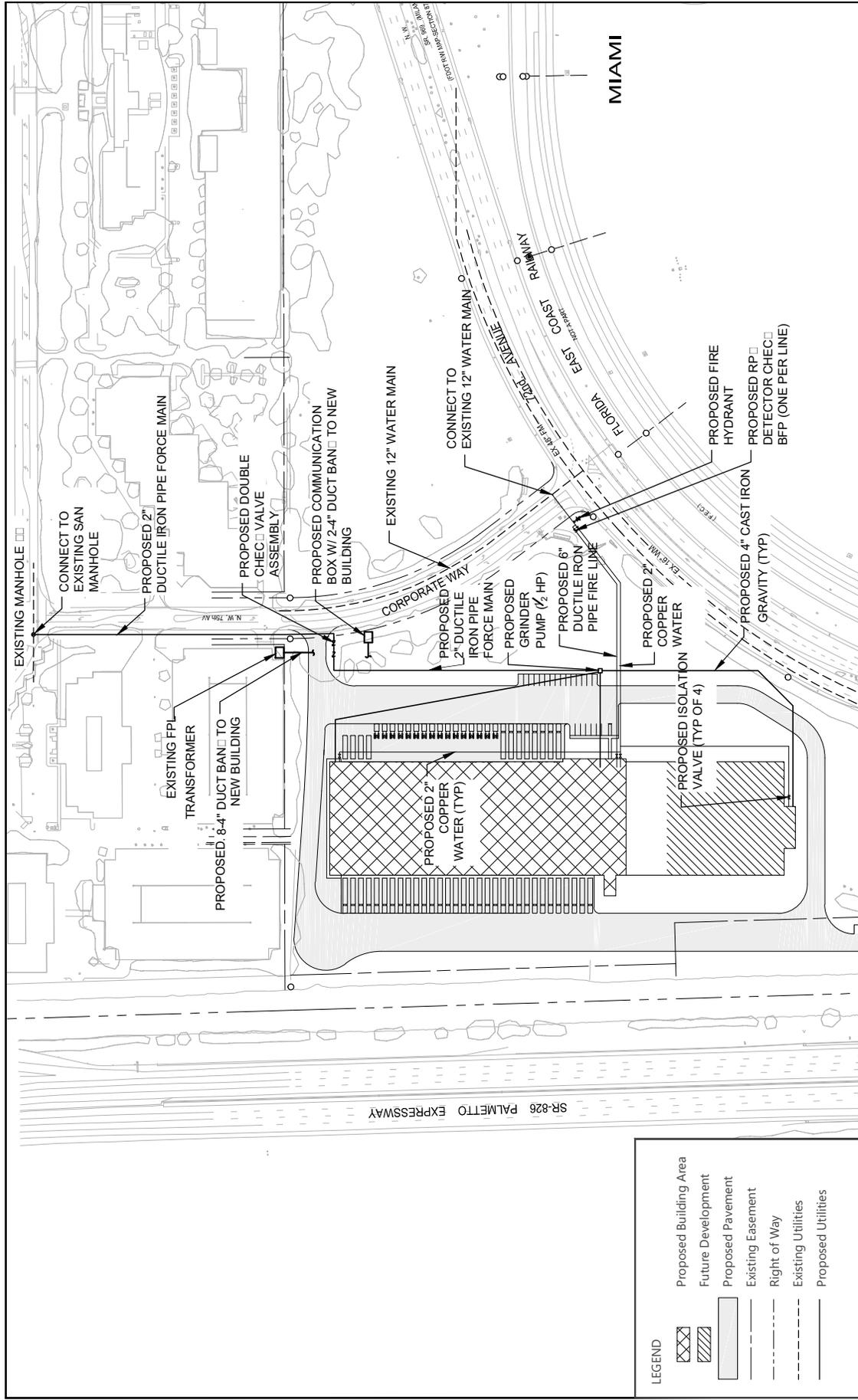
### 7.6.2.1 EXISTING CONDITIONS

Currently, a 12-inch ductile iron (DI) water main is in the general northeast direction of the proposed facility site, running along Corporate Way, and a 16-inch DI water main is in the general southeast direction of the proposed facility site, running along NW 72nd Avenue (Milam Dairy Road). Additionally, a plugged 12-inch water main that connects to the main 16-inch DI water main on Milam Dairy Road extends into NW 14th Street, approximately 74 feet from the 16-inch DI water main. Existing water distribution lines can be found via the Miami-Dade Water and Sewer Department Water Transmission Atlas, as provided in **Appendix G**, Sheets N13 and N13.5.

### 7.6.2.2 DESIGN REQUIREMENTS

Potable water service to the new facility will be provided through a connection to the existing water distribution system located along NW 75th Avenue (Corporate Way). The A/E Consultant shall be responsible for designing the new water mains and connections to the existing potable water distribution system to serve the potable water demands of the proposed fumigation facility, as well as determining flow requirements and the size of service connections, including fire flows and fire protection inside the structure. The on-site water distribution system will consist of new pressurized water mains, reduced pressure zone backflow preventers, isolation valves, or any other means necessary to convey water demand flows.

Sufficient flow is anticipated to be available in the existing 12-inch water main to meet the fire-flow demand and the requirements for the new facility; however, the A/E Consultant will be responsible for verifying the flow and pressures in the existing and new water main(s) are adequate and comply with Water and Sewer Department, local, and state requirements for new fire hydrants, new fire lines, and new water services, prior to finalizing a design for connecting to the existing water mains.



LEGEND

	Proposed Building Area
	Future Development
	Proposed Pavement
	Existing Easement
	Right of Way
	Existing Utilities
	Proposed Utilities

SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).



**EXHIBIT 7-1**  
**EXISTING AND PROPOSED UTILITIES**  
**CONCEPTUAL**

Anticipated potable water consumption flows are expected to mirror those of the sewage flows. Table 7-1 lists the total estimated sewage flow per the MDC Code of Ordinances Section 24.43-1, Liquid Waste Disposal and Potable Water Supply Systems. Based on the proposed facility square footage, the water consumption flow estimated for the facility is 3,315 gpd (2.3 gpm).

Preliminary determination of fire flows has been conducted based on the MDC Code of Ordinances Section 2-103.21, Required Fire Flow, Consumption, Table 1. The proposed site falls within the GP zoning district per the Miami-Dade Zoning Map geographic information system (GIS) map application, which is not included in Table 1 of the MDC Code of Ordinances Section 2-103.21. However, based on the surrounding zonings (industrial districts), it is anticipated that the facility will adhere to the requirements for zonings IU-1, IU-2, IU-3, or IU-C (i.e., the system delivers not less than 3,000 gpm at 20 pounds per square inch residual on the system and that each fire hydrant delivers not less than 1,000 gpm). Water service and fire flow will be split near the property line; the flows will be delivered separately on-site, with backflow preventers and isolation valves in each line.

### 7.6.2.3 RECOMMENDATION (CONCEPTUAL PLAN FOR WATER SUPPLY)

An 8-inch DI water main is suggested for connection from the property to the existing 12-inch water main along NW 75th Avenue (Corporate Way). The 8-inch DI water main shall carry the water flow to the property line and into the site, immediately west of NW 75th Avenue. Near the property line, the 8-inch water main shall be split into a 2-inch copper potable water service line and a 6-inch DI fire supply line, each with an appropriately sized reduced-pressure zone detector check backflow preventer situated near the property line within the site. The 2-inch copper service lines shall split into two additional 2-inch copper service lines due to the layout of the facility's restrooms (one at each side). In addition, each water supply water main shall include an isolation valve.

The 6-inch fire line shall bring water supply into the facility near the tenant offices, while the 2-inch service lines will bring water supply to the tenant offices and the north and south supplemental restrooms. The reason for this is that it is anticipated that restrooms are to be located within the tenant office area in addition to the north and south supplemental restrooms.

One fire hydrant shall be provided on-site near the north property line, and additional fire hydrants will be located at the discretion of an MDC Fire Marshall. For purposes of this Conceptual Plan, one additional fire hydrant is proposed at the southwest corner of the property.

It is worth noting that a Water Supply Certification Letter will be required for connecting to an existing water supply system, in order to certify that adequate water supply is available following an increase in water consumption from the facility's water supply demands.

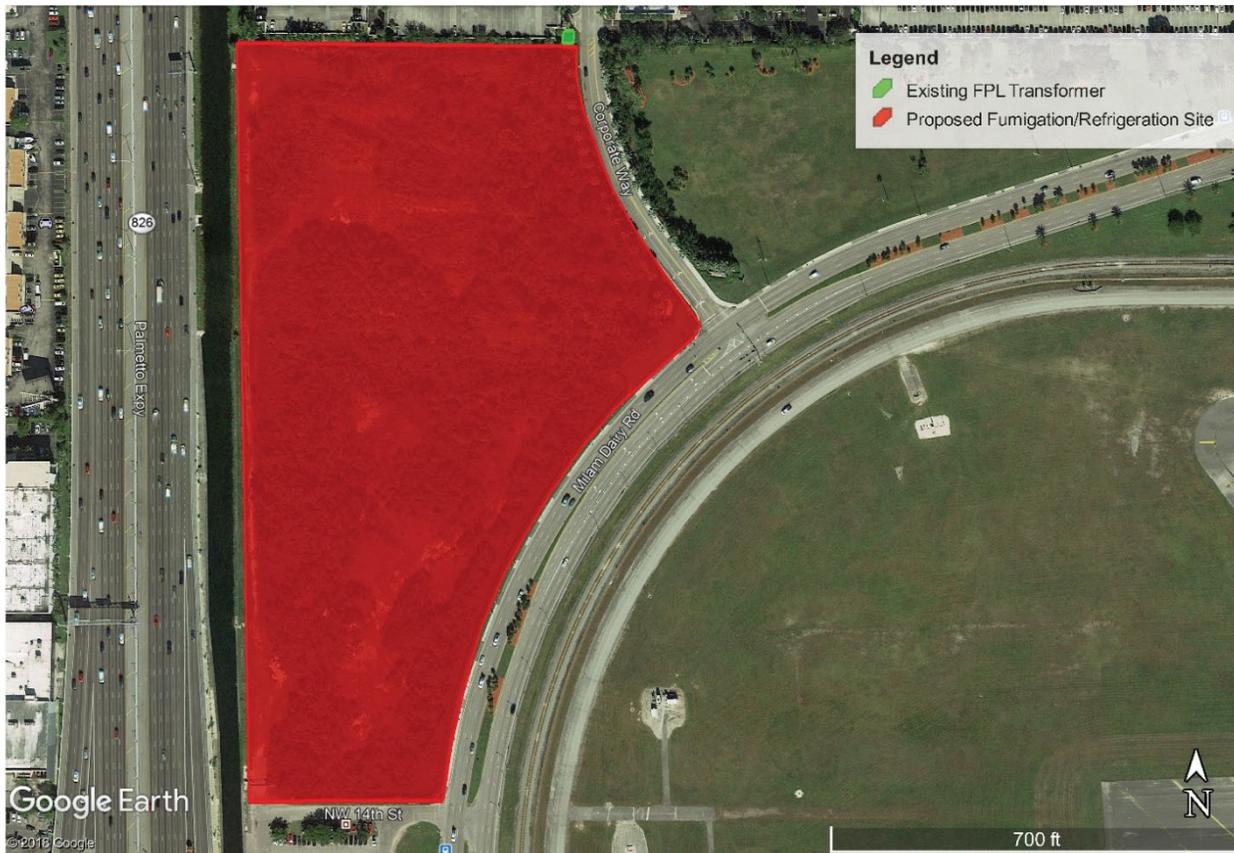
## 7.6.3 ELECTRICAL AND COMMUNICATIONS

### 7.6.3.1 EXISTING CONDITIONS

A FPL transformer is currently located near the southeast corner of an existing parking garage, north of the proposed facility site. It is anticipated that the power and telecommunications demand for the proposed facility will not be met by the existing transformer, potentially requiring the construction of a new transformer. **Exhibit 7-2** shows the location of the existing FPL transformer in relation to the proposed site.

Regarding communications service, attempts were made to contact AT&T to determine the location of the AT&T service, but no response was received.

## EXHIBIT 7-2 EXISTING SUBSTATION NEAR PROPOSED FUMIGATION/REFRIGERATION FACILITY SITE



NOTE: FPL – Florida Power & Light

SOURCE: Nova Consulting, December 2018 (civil infrastructure improvements); Google Earth Pro, 2018.

### 7.6.3.2 DESIGN REQUIREMENTS

Coordination will be required between the A/E Consultant and FPL to connect to the existing transformer. Further coordination may potentially be required for the construction of a new transformer on-site to provide the required power, given that the refrigeration component of the facility is anticipated to require significant power.

Coordination with AT&T will also need to be conducted to bring the service to the east side of the property, along NW 75th Avenue. Power and telecommunications demand and requirements for the facility are discussed in the section 7.2 of this Project Book.

Power and communication lines shall be embedded in concrete encased conduits (duct banks) that follow MDAD requirements and specifications.

### 7.6.3.3 RECOMMENDATION

The A/E Consultant shall be responsible for designing the electrical and communication service connections, as well as conducting all necessary coordination with FPL and AT&T (communication provider) to bring all services to the north property line. This includes verifying new electrical infrastructure and equipment is sufficient to serve the electrical and power demands of the proposed Fumigation/Refrigeration facility, as well

as determining the size of service connections or any other means necessary to supply electrical and communication demand, as required.

From the property line, an electrical duct bank is proposed consisting of eight 4-inch lines to bring power from the existing FPL transformer. The electrical duct bank shall be extended from the proposed transformer to a point of connection to the building, yet to be determined as of the time of this writing.

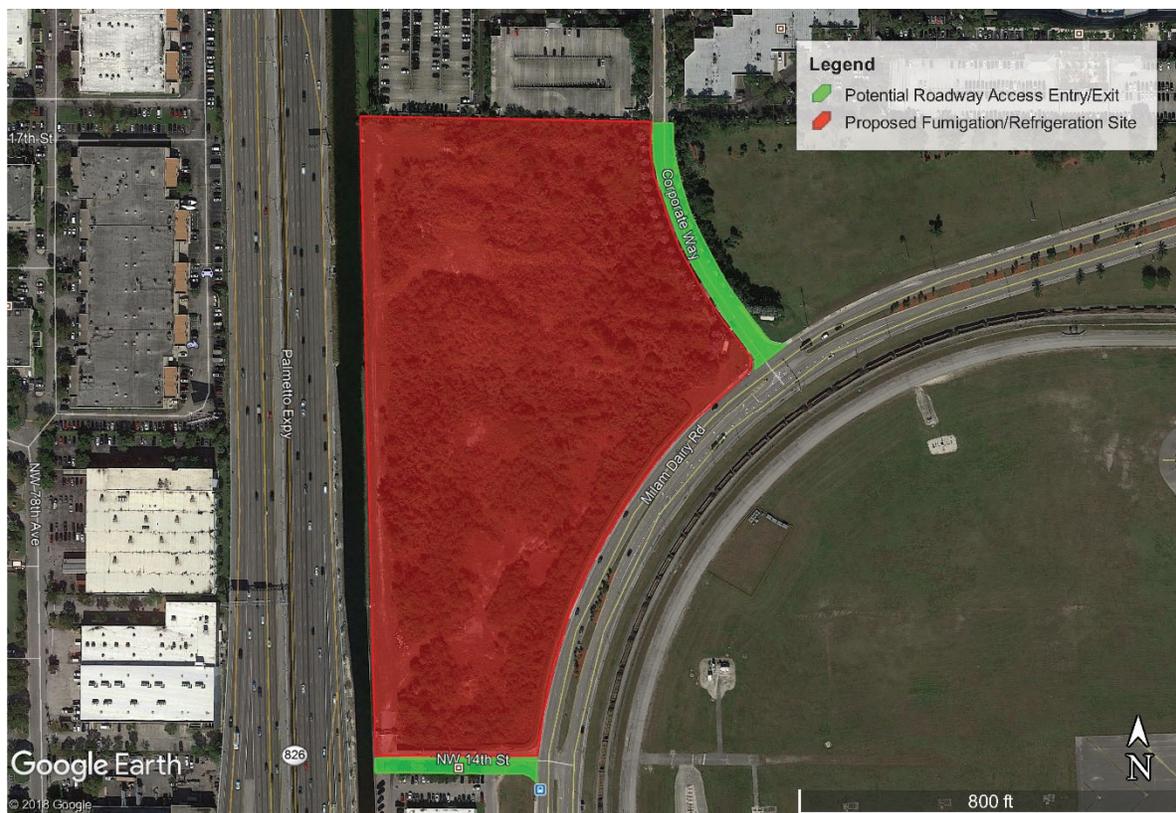
Additionally, also starting at the property line, a separate communication duct bank is proposed, consisting of two 4-inch lines to bring the communications to an on-site communications box. The communication duct bank should extend from the proposed communications box to a point of connection to the building, yet to be determined as of the time of this writing.

## 7.6.4 ACCESS ROADWAYS

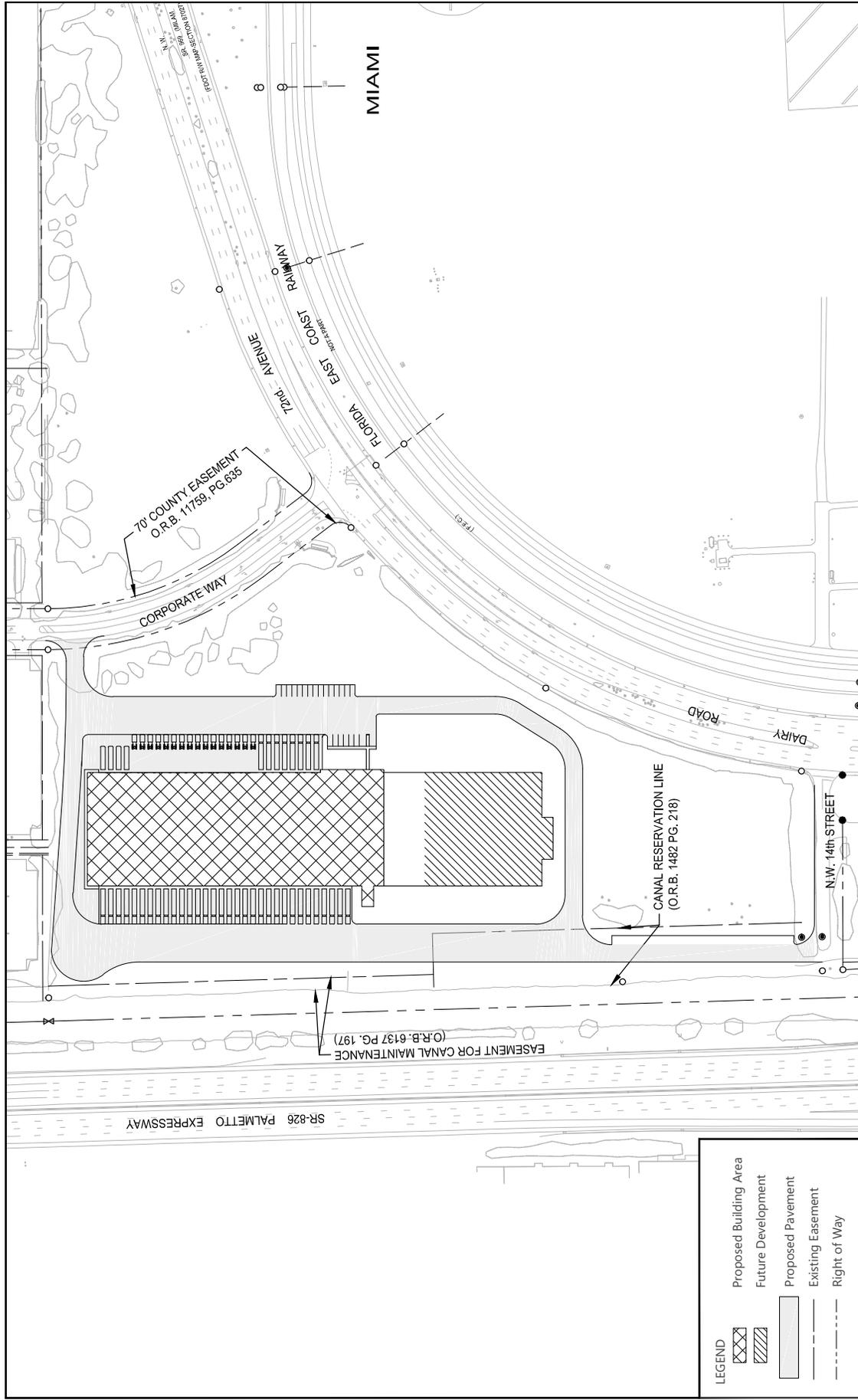
### 7.6.4.1 EXISTING CONDITIONS

The proposed project site is bound by two parking garages to the north, Corporate Way and Milam Dairy Road to the east, NW 14th Street to the south, and a canal east of Palmetto Expressway (SR 826) to the west. Access to the proposed facility site can be provided via Corporate Way and NW 14th Street. **Exhibit 7-3** illustrates the existing roadways that may be utilized for access into the proposed facility site. **Exhibit 7-4** depicts the proposed facility site, illustrating how the proposed internal roadway connects to the existing entry/exit roadways.

#### EXHIBIT 7-3 ENTRY/EXIT ACCESS ROADWAY TO PROPOSED FUMIGATION/REFRIGERATION SITE



SOURCE: Nova Consulting, December 2018 (civil infrastructure improvements); Google Earth Pro, 2018.



SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).



EXHIBIT 7-4

CONCEPTUAL SITE DEVELOPMENT

#### 7.6.4.2 DESIGN REQUIREMENTS

Based on the use of the facility, the largest expected vehicle to be accommodated by the access roadways into the proposed facility is a WB-50 Semi-Trailer (8.5 feet wide by 55.0 feet long). The turning radius on the access roadway and on internal roadways at the site were verified utilizing the Vehicle Tracking application on Civil 3D. **Exhibit 7-5** provides turning radius verification. In addition, operational requirements suggest the entry and exit points to be separated.

While vehicle maneuvering was considered, a traffic study to address existing and/or proposed traffic conditions/impacts resulting from additional loading generated by the new facility was not performed and is highly recommended to be performed as part of the design. The A/E Consultant shall verify the noted traffic conditions/impacts, including undertaking any traffic impact study necessary, and will provide further recommendations/solutions.

#### 7.6.4.3 RECOMMENDATION

The A/E Consultant shall be responsible for verifying and designing the internal and external roadway system to serve the facility, including all necessary coordination with Miami-Dade County, MDAD and any other agencies involved. This includes verifying design vehicle requirements, access entry/exit routes, signalization, internal circulation, turning radius, parking, among others.

Based on adjacent roadways and operational requirements, it is recommended to use NW 14th Street as entry point at the southwest corner of the facility and NW 75th Avenue as exit point at the northeast corner of the facility. This proposed access route for trucks bringing products for fumigation and/or refrigeration on-site was deemed appropriate for accommodating the expected vehicle accessing the facility.

### 7.6.5 SITE DEVELOPMENT

#### 7.6.5.1 FINISHED FLOOR ELEVATION

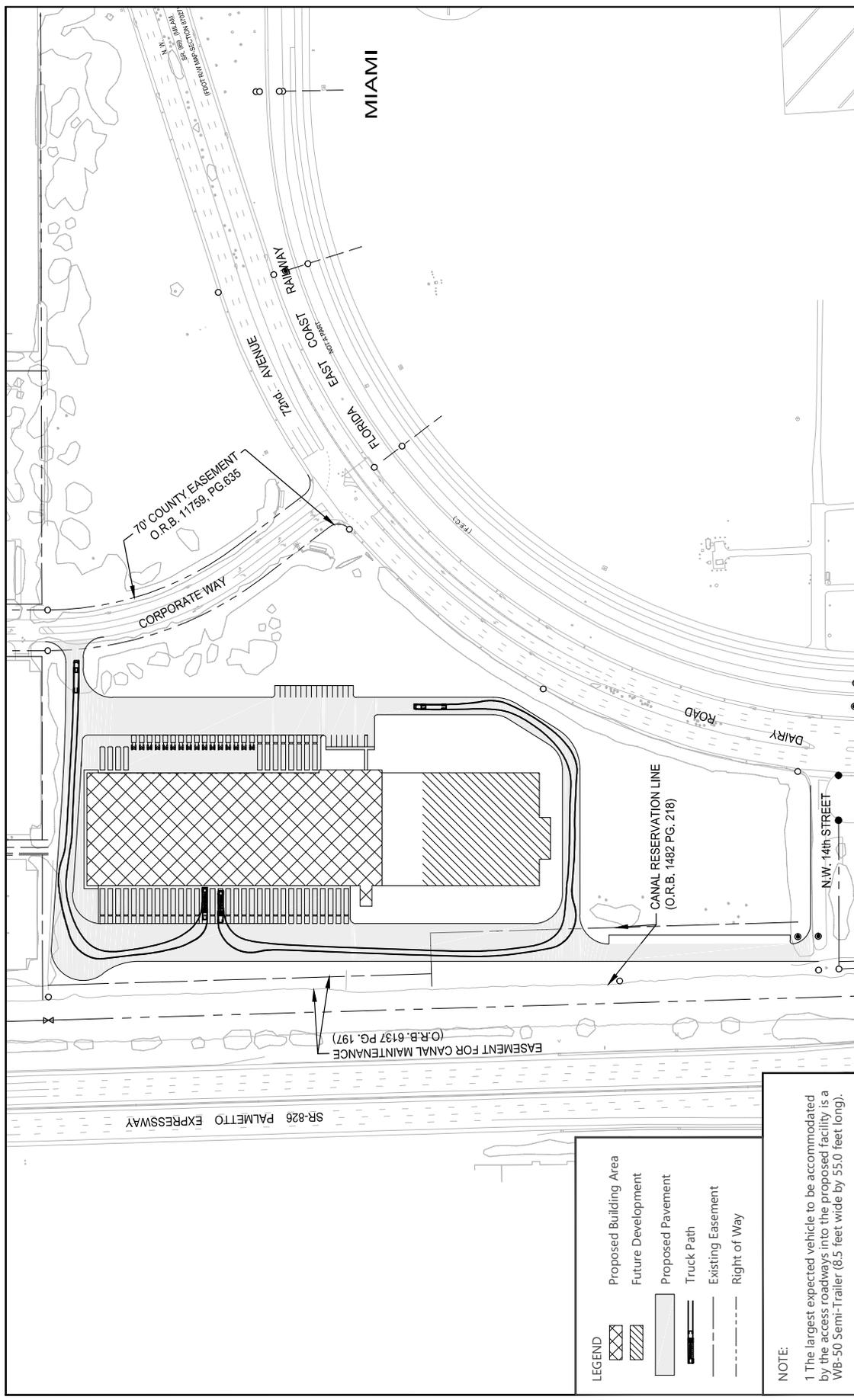
##### ***Existing Conditions***

The current average site elevation, as obtained from the Miami-Dade County GIS 5-foot Digital Elevation Model using U.S. Geological Survey's light detection and ranging (LIDAR) data with elevations in the North American Vertical Datum of 1988 (NAVD88), ranges between 6 to 36 feet (NAVD88), with an approximate average site elevation of 15 feet (NAVD88). **Exhibit 7-6** shows the existing grading obtained with the LIDAR data.

##### ***Design Requirements***

Building floors shall be above the 100-year flood elevation, as determined from the Federal Emergency Management Agency (FEMA) Flood Map Service Center's Flood Insurance Rate Map (FIRM). Based on the American Society of Civil Engineers 24-14, *Flood Resistant Design and Construction Standard*, and using a Flood Design Class 2, the minimum elevation of the lowest floor shall be the base flood elevation (BFE), as obtained from the FEMA FIRM, plus 1 foot. Based on mitigation measures applied for similar projects, an additional 6 inches is recommended to mitigate for sea-level rise.

The FEMA FIRM referenced is included in **Appendix H**, which depicts the zones applicable to the proposed site. The center and majority of the site falls within Zone X (area of minimal flood hazard), while the northeast boundary falls within Zone AH, and the west boundary falls within Zone AE. The BFE for Zones AE and AH per the FEMA FIRM is 7.00 feet, which translates to approximately 5.50 feet in the NAVD88.



**LEGEND**

	Proposed Building Area
	Future Development
	Proposed Pavement
	Truck Path
	Existing Easement
	Right of Way

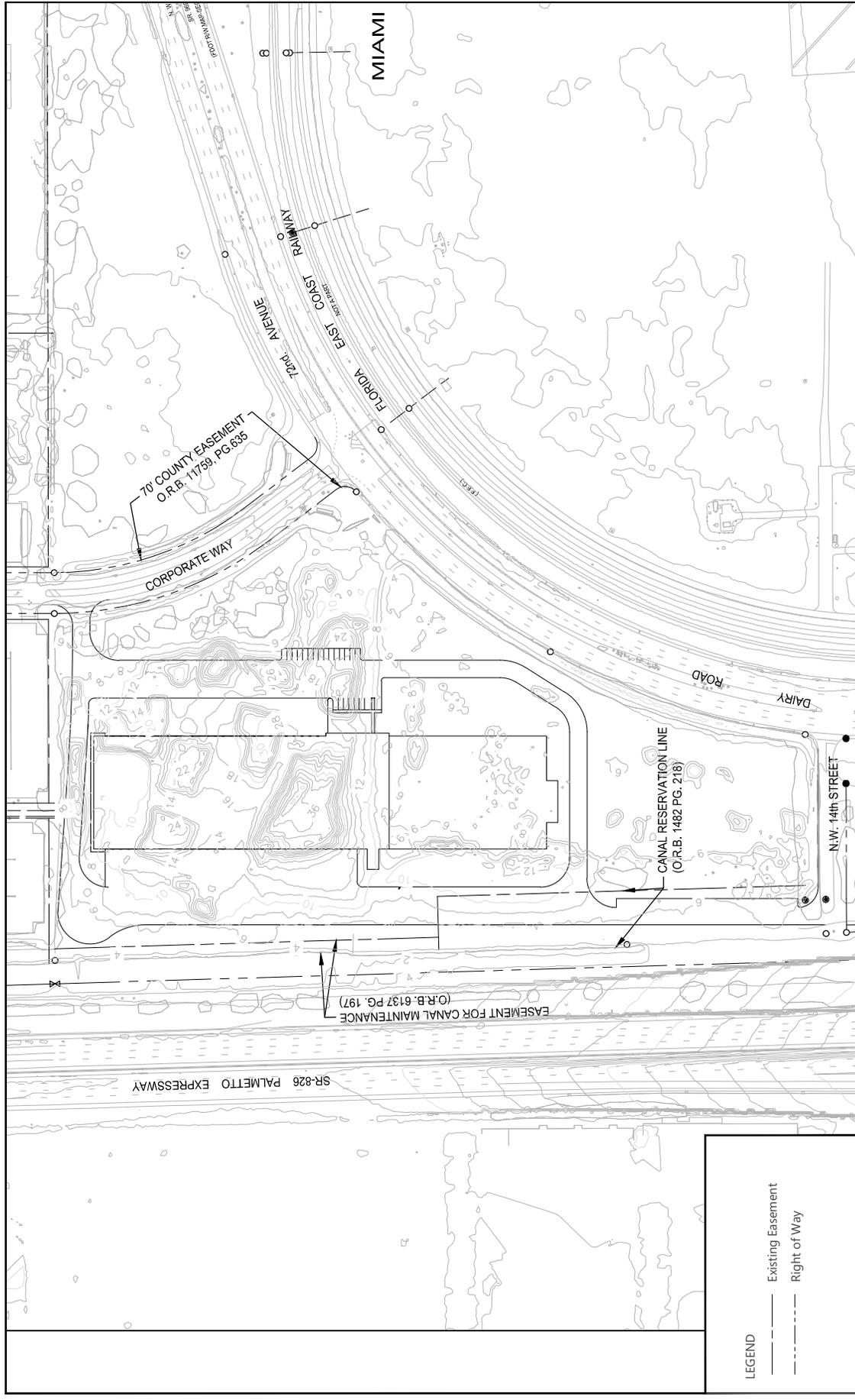
**NOTE:**  
 1 The largest expected vehicle to be accommodated by the access roadways into the proposed facility is a WB-50 Semi-Trailer (8.5 feet wide by 55.0 feet long).

SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).



**EXHIBIT 7-5**

**ACCESS ROAD MANEUVER VERIFICATION**



SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).

EXHIBIT 7-6

EXISTING GRADE ELEVATION

**Table 7-2** briefly describes the applicable flood zones.

**TABLE 7-2 DESCRIPTION OF APPLICABLE PROPOSED SITE FLOOD ZONES**

FLOOD ZONE	DESCRIPTION
AE	An area subject to inundation by 1.0% annual chance flooding, for which BFEs have been determined.
AH	An area subject to inundation by 1.0% annual chance shallow flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet.
X (unshaded)	Area of minimal flood hazard and higher than the elevation of the 0.2% annual chance flood.

NOTE: BFE – Base Flood Elevation

SOURCE: Nova Consulting, December 2018 (civil infrastructure improvements)

### **Recommendation**

Using the BFE for Zones AE and AH of 5.50 feet (NAVD88) as the basis for determining the facility's finished floor elevation (FFE), this would yield a minimum required FFE of 7.00 feet (NAVD88), based on the design requirements for FFE described herein. However, given that the portions of the site that fall within Zones AE and/or AH are small compared to most of the site that falls within Zone X, it is recommended to provide an FFE of 10.0 feet (NAVD88) to maximize regrading efforts. Although the average existing grade elevation is approximately 15.0 feet (NAVD88), using an FFE of 10.0 feet (NAVD88) also mitigates an abrupt change in elevation from the neighboring entry/exit points to the site.

### **7.6.5.2 GRADING, PAVING, AND DRAINAGE**

#### **Existing Conditions**

Based on MDC Public Records, the property is currently owned by MDAD Finance.

Upon search for existing permits associated with the property, no permits were identified that could confirm the existing grading and drainage conditions and/or any characteristics of the existing stormwater management system.

Exhibit 7-6 shows the existing grading within the project site. On-site elevations range from 6 to 36 feet (NAVD88), with the lower elevations between 6 to 8 feet (NAVD88), predominantly around the borders of the site. These conditions suggest a drainage flow direction from the center of the property towards the outer edges.

One existing water body may serve as an area that could receive overflow discharges from any proposed stormwater management system within the site—the North Line Canal that borders the entire west boundary of the site and is adjacent to State Road 826 (Palmetto Expressway). This canal is under jurisdiction of MDC, and it connects downstream to the South Florida Water Management District (SFWMD) C-4 Canal. Coordination with both agencies is anticipated to be required during design to confirm drainage conditions and requirements.

#### **Design Requirements**

For drainage assessment, based on the SFWMD Environmental Resource Permit (ERP) Applicant's Handbook: Volume II, a storm event of 3-day duration and 25-year return frequency was used for preliminary calculations. Per the handbook, for a 3-day rainfall and 25-year return period, the design storm for the project site amounts to 14 inches of rainfall in 3 days.

Per SFWMD guidelines, full on-site retention must be provided for the 3-day, 25-year storm event shall be used in sizing the elements of the proposed stormwater management system for the area. Off-site discharges are to be

maintained to a minimum and are only allowed during exceptional extreme events. At a minimum, the first inch of rainfall that is not absorbed by the ground is required to be retained on site, prior to discharge. Eventual stormwater overflow discharge may be required in exceptional emergency situations, for which the North Line Canal may be utilized. Any overflow discharge water must be authorized by the Department of Environmental Resources Management (DERM) and SFWMD and pre-treated to an acceptable level of water quality. The discharge rate must never exceed the maximum allowable flow as defined by the SFWMD and DERM. Coordination with the SFWMD and DERM will be required at the time of preliminary design to confirm all permitting requirements, including the allowable rates for overflow discharge criteria.

Upon consultation with DERM for this Project Book, it was determined that the North Line Canal on the west side of the property may receive overflow discharges in case of an extreme event.

### *Design Storm*

Unless otherwise specified by previous permits or criteria, full on-site retention of a storm event of 3-day duration and 25-year return frequency will be used in sizing the elements of the proposed stormwater management system. Off-site discharges are to be maintained to a minimum and are only allowed during exceptional extreme events. Coordination with the SFWMD and DERM will be required at the time of preliminary design to confirm all permitting requirements, including the allowable rates for overflow discharge criteria.

Upon consultation with DERM for this Project Book, it was determined that the North Line Canal located along the west boundary of the property may receive overflow discharges in case of an extreme event.

### *Water Quantity*

The A/E Consultant shall submit flood routing calculations as part of the ERP submittal to identify combinations of site conditions (i.e., grading, drainage patterns, exfiltration rates) and rainfall frequencies, which should result in an acceptable impact to the site and/or surrounding properties.

### *Off-Site Discharge Rate*

The off-site discharge rate is limited to exceptional extreme events, as well as limited to rates not causing adverse impacts to existing off-site properties:

- historic discharge rates
- rates determined in previous district permit actions
- rates specified in district criteria

Close coordination by the A/E Consultant with the governing environmental agencies (DERM and SFWMD) will be required during design to determine the allowable off-site discharge rates for storms exceeding the design storm event.

### *Water Quality*

The water quality criteria set by SFWMD (ERP Applicant's Handbook: Volume II) is a volumetric value that must be provided within retention, detention, or both retention and detention in the overall system, including swales, exfiltration trenches, lakes, canals, or greenways. The criteria will be provided for one of the three following criteria, or equivalent combinations thereof:

- Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater.
- Dry detention volume shall be provided equal to 75 percent of the amounts computed for wet detention.
- Retention volume shall be provided equal to 50 percent of the amounts computed for wet detention.

Wet retention ponds are not a suitable stormwater drainage design alternative per FAA Advisory Circular 150/5200-33B; therefore, the A/E Consultant shall use other methods of detention.

Since this facility may be considered industrial due to surrounding properties with industrial zoning, an additional 50 percent of the dry detention volume shall be provided, unless reasonable assurance can be offered during design that hazardous materials will not enter the surface water management system.

Dry detention areas shall be designed to have a minimum bottom elevation equal to a minimum 1 foot above the average ground water level.

Close coordination by the A/E Consultant with the environmental agencies (DERM and SFWMD) is required during design to determine the requirements for water quality, as well as to determine the stormwater management features to be utilized to meet the criteria.

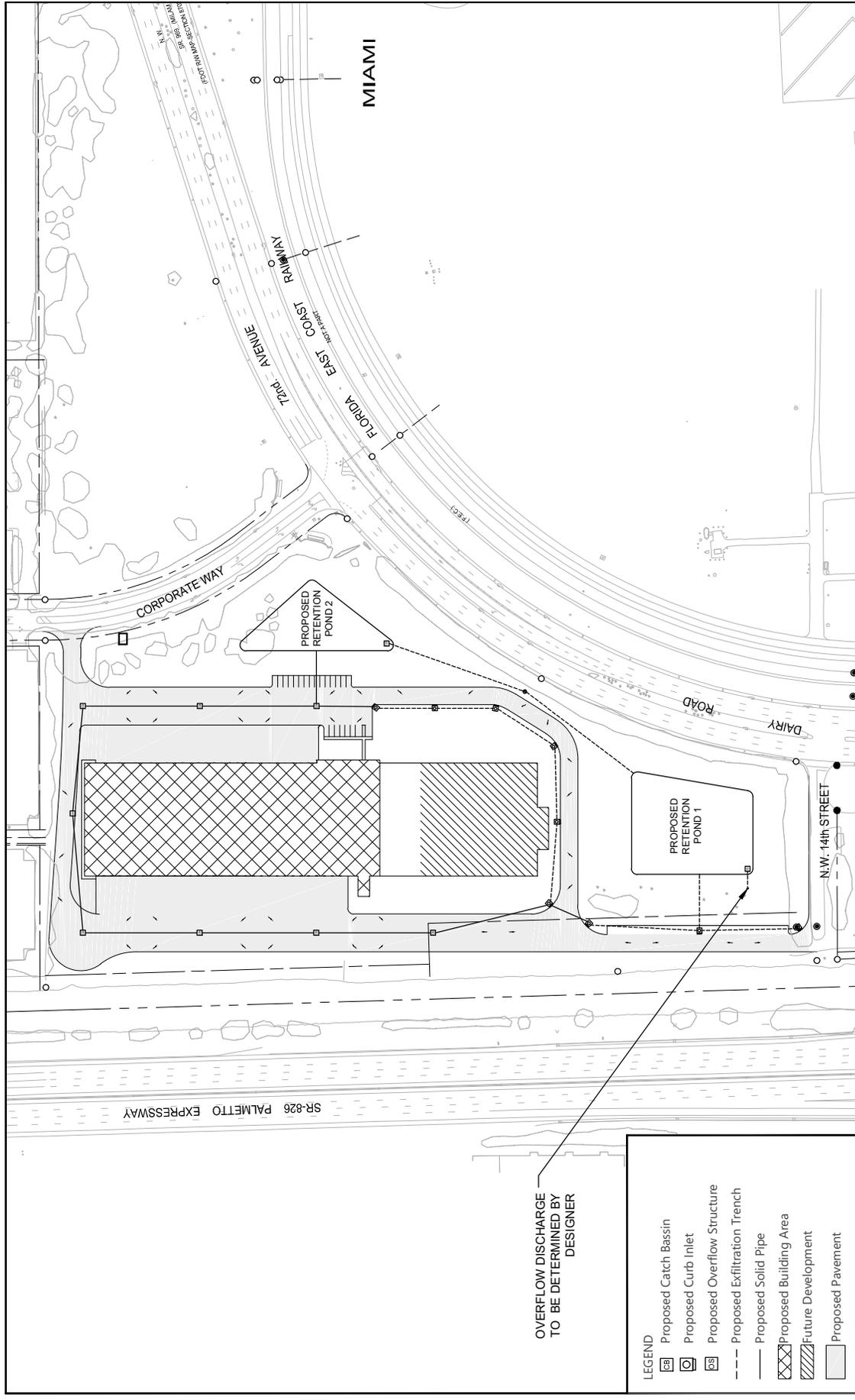
### **Recommendation**

The drainage system shall consist of a combination of proposed catch basins, pipes, exfiltration trenches, and dry detention areas. The drainage design concept would consist of catch basins that would collect the entire runoff from the site and would convey the stormwater flows to the proposed exfiltration trenches located underneath swales and pervious areas for storage, treatment, and infiltration. Dry detention areas shall collect stormwater flows from saturated exfiltration trenches, which shall sit on a gravel filter bed to assist in the draining of the collected stormwater. The A/E Consultant shall ensure that the dry detention areas are designed with a 48-hour maximum detention period and will stay completely dry between storms per FAA Advisory Circular 150/5200-33B.

Based on preliminary drainage assessment, the linear feet of proposed exfiltration trenches that can be accommodated together with the storage provided by the proposed dry detention areas, appear to be sufficient to provide the required full on-site containment of the 3-day, 25-year design storm event. In the case of an extreme event, an overflow connection will be required. Adjacent to the proposed site on the west side is the North Line Canal. A DERM Class II permit is required for the construction of a drainage system with overflow on any water body.

The A/E Consultant shall verify the above recommendation, conduct all geotechnical and percolation testing to obtain site-specific parameters (i.e., hydraulic conductivity) and will coordinate with DERM and SFWMD to ensure the design calculations meet permit requirements.

**Exhibit 7-7** illustrates the proposed elements for a conceptual stormwater management system for the project site. This preliminary concept considers the elements discussed in this section regarding the FFE, site grading, drainage structures and well, retention/detention areas, and exfiltration trenches.



OVERFLOW DISCHARGE  
TO BE DETERMINED BY  
DESIGNER

- LEGEND**
- Proposed Catch Basin
  - Proposed Curb Inlet
  - Proposed Overflow Structure
  - Proposed Exfiltration Trench
  - Proposed Solid Pipe
  - Proposed Building Area
  - Future Development
  - Proposed Pavement

SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).



EXHIBIT 7-7

SITE DRAINAGE CONCEPTUAL PLAN

### 7.6.6 ENVIRONMENTAL CONSIDERATIONS

The subject property is located on the west side of Milam Dairy Road (NW 72nd Avenue), between NW 14th Street and Corporate Way. It is currently part of two folios, 30-3035-000-0072 and 30-3035-000-0090, both owned by the Miami-Dade County Aviation Department. Based on review of historical aerial imagery using Google Earth, the subject property seems to have been cleared between 1999 and 2002, and used for temporary storage of various items, including drainage structures and possibly storage trailers, and soil stockpiling from approximately 2002 to 2013. The subject property seems to have remained unused since 2013, and the majority of the original foliage has returned. A desktop historical file review was conducted for the subject property, utilizing the Miami-Dade County Department of Environmental Resource Management (DERM) online database and Environmental Considerations GIS (ECG) Tool, and the Florida Department of Environmental Protection (FDEP) online database tools, Oculus and Map Direct.

Although no files in regard to historical site use and environmental concerns were found, a DERM file number was provided by DERM for inclusion in this Project Book. As per DERM's file number ARP-162, the site has been historically used for contaminated soil staging. As such, stockpiled soil should be sampled and assessed for either disposal criteria or for soil reuse, in accordance with the DERM Soil Reuse Guidelines.

Due to the unknown nature of the stockpiled soil and temporary storage trailers noted in the aerial images, there is a possibility that these practices pose an environmental risk in which various chemicals may have leached into the soil and/or groundwater over time. As such, it is recommended that the underlying soil and groundwater be assessed as well. A sampling plan, based on site history and soil pile data, shall be submitted to DERM for review and approval prior to subsurface investigations. Based on the sample results for the site, the preparation of a soil management plan, dust control plan, and health and safety plan may be required to be submitted to DERM for review and approval prior to construction. Additionally, drainage design will be dependent on the results of the groundwater sampling. The A/E Consultant shall be responsible for implementing the appropriate drainage requirements if contamination is present, including but not limited to obtaining a Class VI drainage permit, as stormwater will not be allowed to percolate in areas where groundwater is determined to be contaminated.



## 8. ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE AND SCHEDULE

### 8.1 ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE AND PROJECT SCHEDULE

Preliminary cost estimates for the proposed fumigation facility are presented in **Appendix I**. The ROM cost estimates are tabulated in 2018 dollars and include provisions for site preparation, new construction, and soft costs. In summary, the total estimated ROM cost for the proposed fumigation facility is \$63.1 million (in 2018 dollars).

#### 8.1.1 COST ASSUMPTIONS – GENERAL

Site preparation, including building foundations, will be needed to clear the site. The existing site is currently served by active utilities, including fire water main, potable water, and sewer. Dry utilities include gas, electrical, and telecommunications. For the proposed location, a full environmental study is recommended prior to commencing work.

The cost estimates only include the construction of the building shell and utilities; the building interior/equipment is assumed to be added by the fumigation operators selected for the project.

The following assumptions were made as part of the soft-cost estimates:

- A/E Consultant services (including owner's allowance): 16.0 percent of total direct construction costs
- Construction Support (including owner's allowance and permitting): 26.5 percent of total direct construction costs
- Indirect Costs: 6.5 percent of total direct construction costs

#### 8.1.2 PRELIMINARY PROJECT SCHEDULE

The proposed fumigation facility shall be constructed in accordance with MDAD's Master Capital Project List. Per MDAD's Master Project List, the proposed facility would commence in 2019. Inclusive of planning, design, procurement, bidding, and construction, it is estimated that it would take approximately 4 years to design and build the facility, with a target operational date set for May 2023 for Phase 1, assuming the planning for the project begins January 2019.

The new fumigation facility project does not have any predecessor, and it can be completed independently of other projects currently shown on MDAD's Master Project List.

### 8.2 OPEN/OUTSTANDING ISSUES

The proposed fumigation facility may affect the circulation on Milan Dairy Road. Therefore, a traffic study is recommended to assess the potential impacts on Milan Dairy Road during the construction phase of the proposed facility.

Furthermore, none of the two fumigation operators at MIA provided feedback on the final facility concepts. Thus, concurrence from Termite Doctor and AI-Flex on the final facility layout will be desirable, as MDAD could be accommodating multiple operators at the new facility.





## APPENDIX A

# United States Department of Agriculture Treatment Manual

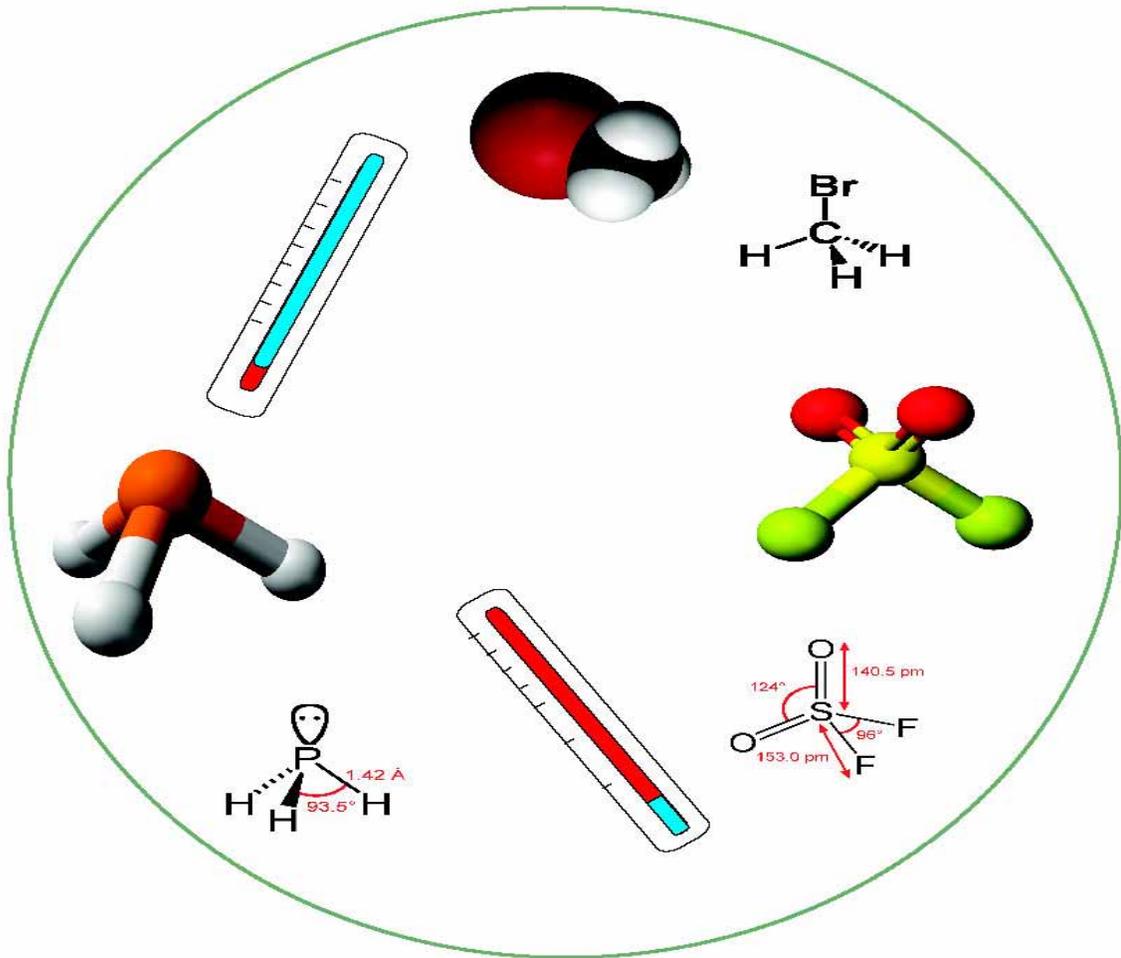
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United States Department of Agriculture

# Treatment Manual



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When using pesticides, read and follow all label instructions.

# 2

Treatment Manual

## Chemical Treatments

### *Fumigants • Methyl Bromide*

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Penetration and Aeration of Boxes and Packages	2-3-8
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Residual Effect	2-3-11

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#### Properties and Use

Methyl bromide (MB) ( $\text{CH}_3\text{Br}$ ) is a colorless, odorless, nonflammable fumigant. MB boils at 38.5 °F and has a very low solubility in water. As a gas, MB is three times heavier than air. As a liquid at 32 °F, 1 pound of MB is equivalent to 262 ml. For ease in transportation and handling, MB is compressed and stored in metal cylinders as a liquid.

MB is an effective fumigant for treating a wide variety of plant pests associated with a wide variety of commodities. MB is the most frequently used fumigant in quarantine fumigations. MB may also be used to devitalize plant material. MB is effective in treating the following pests:

- ◆ Insects (all life stages)
- ◆ Mites and ticks (all life stages)
- ◆ Nematodes (including cysts)
- ◆ Snails and slugs
- ◆ Fungi (such as oak wilt fungus)

MB is effective over a wide range of temperatures (40 °F and above). In general, living plant material tolerates the dosage rate specified, although the degree of tolerance varies with species, variety, stage of growth, and condition of the plant material. MB accelerates the decomposition of plants in poor condition.

Since MB is three times heavier than air, it diffuses outward and downward readily, but requires fans to ensure upward movement and equal gas distribution. Fan circulation also enhances penetration of MB into the commodity. A volatilizer is used to heat the liquid MB in order to speed up its conversion to a gas. Once the gas is evenly distributed, it maintains that condition for the duration of the treatment unless an outside event such as excessive leakage occurs.

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## Section 18 Exemption Treatment Schedules

Methyl bromide fumigants, except those with “Q” labels, may be subject to requirements of the FIFRA Section 18 Quarantine Exemption. When commodities intended for food or feed are fumigated with methyl bromide under the FIFRA Section 18 Quarantine Exemption, one additional EPA *requirement* must be met: PPQ must monitor aeration by sampling the gas concentration to determine when a commodity may be released.

The EPA defines a Federal quarantine exemption (40 CFR 166.2(b)) as “A quarantine exemption may be authorized in an emergency condition to control the introduction or spread of any pest new to or not theretofore known to be widely prevalent or distributed within and throughout the United States and its territories.”

The section 18 Crisis Exemption has been amended to permit treatment of commodities that are at risk for carrying Federal quarantine pests. This means that treatments are permitted not only for imported commodities, but also for domestic commodities growing in areas under quarantine for a regulated pest. This exemption does not authorize treatments of domestically grown commodities for export certification **unless** the treatment is necessary to move the commodity out of quarantine, i.e. the target pests must be Federally regulated pests.

In this manual, fumigation schedules under the FIFRA Section 18 Quarantine Exemption are followed by an “Important” note to help you determine the current exemption status. For example:

Example Treatment Schedule Table			



Do **not** use this treatment schedule if its FIFRA Section 18 Exemption has expired. For the current exemption status, call your local State Plant Health Director (SPHD).

**Table 2-3-1** is a list of commodities covered by the FIFRA Section 18 exemption. This list will expire on March 01, 2020.

**Table 2-3-1 List of Commodities Covered by FIFRA Section 18 Exemption**

Commodity	Minimum Temperature (F)	Maximum Dosage Range (lb/1000 ft <sup>3</sup> )	Exposure Period (hours)
Avocado	70	4	4
Banana and Plantain (fruit)	40	4	2
Banana leaf	40	4	2
Blueberry and unlabeled commodities from the berry and small fruit crop group 13-07	40	4	4
Cacti, edible (includes Opuntia)	40	4	3.5
Coffee bean (green, unroasted)	40	9	12
Coconut (unprocessed, whole coconut without husk)	60	2.5	2
Cottonseed (for animal feed)	40	7	24
	40	5	48
Cucurbit seed (unprocessed)	40	9	12
Dasheen (root and tuber)	40	4	4
Figs, fresh	40	4	3
Flowers, squash and lorocco	40	4	2
Genip (Spanish Lime)	40	4	4
Herbs and spices, fresh (crop group 19)	40	4	4
Ivy gourd	40	4	2
Kaffir lime leaves	40	4	2
Kola nut (cola)	40	6	6
Longan	60	4	2
Lychee fruit	40	4	2
Mango	40	4	2
Mint, dried	40	3	24
Mint, fresh	40	4	2
Oilseed (crop group 20)	40	9	12
Persimmon	40	4	2
Pitahaya (pitaya or dragon fruit) <sup>1</sup>	40	4	2
Pomegranate, fresh	40	4	3
Pointed gourd	40	4	2
Rambutan	60	4	2
Seeds in the family Malvaceae for food use, including hibiscus and kenaf seed	40	3.5	2
Unlabeled commodities in the leaves of legume vegetable crop group 7 <sup>2</sup>	40	4	2.5
Unlabeled commodities in the root and tuber crop group 1 <sup>2</sup>	60	3	3.5
Unlabeled commodities in the stone fruit crop group (12-12) <sup>2</sup> (i.e. pluot, plumcot, aprium, cherrycot, peachcot)	40	4	3

**Table 2-3-1 List of Commodities Covered by FIFRA Section 18 Exemption (continued)**

Commodity	Minimum Temperature (F)	Maximum Dosage Range (lb/1000 ft <sup>3</sup> )	Exposure Period (hours)
Unlabeled commodities in the Bulb Vegetable crop group (3-07) <sup>2</sup>	40	4	4
Unlabeled commodities in the stalk, stem, and leaf petiole crop group 22 <sup>2</sup>	40	4	3.5
Unlabeled commodities in the following crop groups <sup>2</sup> :	40	4	2
◆ Brassica leafy vegetables (crop group 5)			
◆ Curcubit vegetables (crop group 9)			
◆ Edible podded legume vegetables (crop group 6A)			
◆ Fruiting vegetable (crop group 8-10)			
◆ Leafy vegetables (except Brassica) (crop group 4)			
◆ Leaves of roots and tubers (i.e. chicory) (crop group 2)			
◆ Tropical and subtropical fruit, edible peel (crop group 23)			
◆ Tropical and subtropical fruit, inedible peel (crop group 24)			

- 1 Dragon fruit is also known as pitahaya or pitaya. Refer to the [List of Scientific Names of Admissible Dragon Fruit](#) for more information.
- 2 The EPA crop groups are listed in [Appendix F on page F-1](#) for quick reference. Refer to [40 CFR 180.41 Crop Group Tables](#) for the official list of commodities within each crop group. **NOTE:** If you have questions regarding what commodities are covered by a particular crop group or whether or not a commodity is labeled or unlabeled, CONTACT Field Operations at 919-855-7336.

The EPA only authorizes fumigation of commodities if they are listed on the label of the gas being used for the fumigation. The fumigator is responsible for ensuring that the commodity, its dosage, and the treatment duration is listed either on the product label or within the Section 18 authorization letter, which the PPQ officer should have readily available for any fumigator who requests it. The methyl bromide products that fumigators are authorized to use for Section 18 treatments are identified within the Section 18 authorization letter. To comply with State requirements, the fumigator is responsible for ensuring that the fumigant is registered in the State where it is being used.

Fumigation schedules in this publication are more detailed than what is provided in commercial labels in order to ensure that the phytosanitary treatments of imported commodities are efficacious.

When the treatment schedule is marked “MB”, **any** methyl bromide fumigant may be used for the fumigation as long as the commodity, its dosage, and treatment duration are on the fumigant label.

## Leak Detection and Gas Analysis

Require the fumigator to use an APHIS-approved gas detection device to measure gas concentration levels in tarpaulins. Require the fumigator to use an APHIS-approved leak detection device primarily to check for leaks around tarpaulins, chambers, application equipment, and as a safety device around the fumigation site. For a partial list of manufacturers of detection devices, refer to [Reference Guide to Commercial Suppliers of Treatment and Related Safety Equipment](#). Colorimetric tubes, which are supplied by the fumigator, are used to measure gas concentration levels during aeration.

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## 2016 Methyl Bromide Label Information

In 2015, the Environmental Protection Agency (EPA) directed all methyl bromide (MB) registrants to amend the use directions on the labels of all 100% MB products. EPA required the changes in order to reflect recommendations in an EPA report.<sup>1</sup>

These amendments modify the use directions for fumigation and aeration procedures, modify respiratory requirements and equipment and update gas monitoring equipment. EPA requires all labels on newly manufactured MB to reflect these recommendations effective **October 01, 2016**; however, EPA is allowing existing stocks of MB to be used in accordance with the use directions on the existing stock's (older) labels.

PPQ officials and fumigators **must** closely examine gas cylinder labels in order to validate that the dosage, exposure, and commodity are either on the cylinder label or covered by a FIFRA Section 18 exemption. If a label is **not** affixed to the cylinder, DO NOT allow the fumigator to use that cylinder.

### New Buffer Zone Requirements

All 2016 MB labels now require both a treatment and an aeration buffer zone. Both the treatment and aeration buffer zones are specific to the enclosure being fumigated and **must** be determined by visiting a [website link<sup>2</sup>](#) provided in every MB label. The fumigators are responsible for using this website to determine the buffer zones and reporting both buffer zones to the PPQ official. If the treatment buffer zone is determined to be less than 30 feet, the PPQ official will maintain PPQ's standard 30 foot treatment buffer zone; otherwise, the new treatment buffer zone **must** be observed.

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1 "Report of Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for methyl bromide, and Reregistration Eligibility Decision (RED) for Methyl Bromide's Commodity Uses", dated August 2006.

([https://archive.epa.gov/pesticides/reregistration/web/pdf/methyl\\_bromide\\_tred.pdf](https://archive.epa.gov/pesticides/reregistration/web/pdf/methyl_bromide_tred.pdf))

2 <https://www.epa.gov/pesticide-registration/mbcommoditybuffer>

If the aeration buffer zone is determined to be less than 200 feet, then PPQ’s standard “200 feet for 10 minutes” aeration buffer zone **still** applies for the first 10 minutes of aeration. The fumigator **must** refer to EPA’s website to determine the minimum aeration buffer zone to be maintained until the aeration period is complete and the fumigator has verified that gas concentration levels meet the conditions in the MB label.

### Transiting through buffer zones

The label permits vehicles to transit through both treatment and aeration buffer zones under specific conditions found in the label; it is up to the fumigator determine how or whether vehicles may transit in accordance with the label.

When using the newer 2016 MB label, changes to certain procedures and equipment in this chapter are displayed in a NOTICE box with a heading titled “MB 2016 Label”.

### MB 2016 Label (example)



Use this information when the fumigator is using the 2016 MB label.

When using existing stocks, follow the equipment and procedural guidance that is displayed in the body of the text (outside of the NOTICE box).

If there is no “MB 2016 Label” NOTICE box, then the instructions apply to all MB labels, 2016 and older.

## MB 2016 Label

**NOTICE**

The PPQ official and the fumigator must use the following leak detection and gas analysis equipment:

- ◆ An air purifying NIOSH certified half-mask or full face piece respirator when gas concentrations are between 1 and 5 ppm
- ◆ A self contained breathing apparatus (SCBA) NIOSH approved prefix TC-13F when gas concentrations are 5 ppm or above
- ◆ An APHIS-approved continuous real time gas monitoring device that is permanently mounted in PPQ owned facilities or a portable photoionization detector to monitor gas concentrations in the breathing space
- ◆ An APHIS-approved direct read gas detection device, such as colorimetric tubes, to determine gas concentrations when aerating and releasing the commodity

For a list of manufacturers and approved models refer to [Reference Guide to Commercial Suppliers of Treatment and Related Safety Equipment](#).

PPQ policy is to wear appropriate respiratory protection when air concentrations are above 1 ppm. However, the new MB labels allow workers to be present without respiratory protection for specific time limits over a 24-hour period when air concentrations are:

- ◆ >3 to 5 ppm (90 minutes),
- ◆ >2 to 3 ppm (160 minutes),
- ◆ >1 to 2 ppm (4 hours), and
- ◆ >0 to 1 ppm (8 hours).

These permissible work-time allowances will give the PPQ official sufficient time to calmly locate and don the appropriate respiratory protection should their PID (alarm set to go off at 1 ppm) indicate the presence of MB in the air.

## Effects of Temperature and Humidity

MB is effective at the same temperatures plants are generally handled (usually 40 °F and above). In general, increases in temperature give a corresponding increase in the effectiveness of MB. All treatment schedule temperatures are listed with the corresponding dosage rate. Follow the dosage rates listed. A Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 3 registration (the labeled rate of MB provided), or a Section 18 Exemption must be in effect at the time of treatment.

For live plant material which is actively growing or with leaves, maintain a high percentage of humidity (above 75 percent) in the chamber by placing wet sphagnum or excelsior in the chamber or by wetting the chamber walls and floor. Protect actively growing or delicate plants from the direct air flow of fans. Do **not** add any moisture to the chamber when fumigating seeds. Too much moisture on the material to be fumigated may prevent the fumigant from reaching some of the pests.

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## Penetration and Aeration of Boxes and Packages

Plastic wrappings such as cellophane, films, and shrink wrap, and papers that are waxed, laminated, or waterproofed are **not** readily permeable and **must** be perforated, removed, or opened before fumigation. Approved packaging materials may be layered as long as perforations allow adequate MB penetration.



Inform prospective importers that all packaging used in USDA quarantine fumigations **must** comply with these Manual specifications or be approved by CPHST-TMT.

USDA-APHIS-PPQ-S&T-CPHST-TMT  
1730 Varsity Drive, Suite 300  
Raleigh, NC 27606  
919-855-7450

The following is a partial list of approved packaging materials:

- ◆ Dry cloth
- ◆ Dry, non-waxed or non-painted cardboard
- ◆ Dry, non-waxed or non-painted non-glossy paper

- ◆ Dry, woven fabrics and plastics
  - ❖ Woven polypropylene bags that are **not** laminated with plastic or paper inside or out (these bags are typically used for holding seeds or grains)
  - ❖ Bags containing a large quantity of seeds or grains (>2,000 lbs.) are referred to as “super sacks” or “totes” and must have the top of the bag opened to aid in fumigant dispersal and aeration
- ◆ Dupont™ Tyvek® Air Cargo Covers (refer to Chapter 8—Equipment [Dupont™ Tyvek® Air Cargo Covers](#) for more information)
- ◆ Pac-Armor™ (Safeguard Global LLC)
- ◆ Perforated plastics with evenly distributed holes on all sides and 0.93 percent open area of surface, for example:
  - ❖ Holes that are 3/16-inch in diameter every 3 square inches
  - ❖ Holes that are 1/4-inch in diameter every 4 square inches
  - ❖ 49+ pinholes per square inch
- ◆ Plastic clamshells
  - ❖ Evenly distributed holes on all sides and 0.93 percent open area of surface
  - ❖ Holes on top and bottom must not be blocked when clamshells are stacked (i.e. clamshells must have recesses or ridges to prevent blockage)
- ◆ Seed packets (from Thompson & Morgan (UK) Ltd.)
- ◆ SmartPac liner with 0.3% vented area (Quimas S.A. Chile)
- ◆ Wooden boxes (lids removed if tightly sealed)

If a commodity is NOT undergoing fumigation, a consignment cannot be rejected because of packaging.



Inform prospective importers that the wrappings on their shipments may have to be perforated according to PPQ specifications, removed, or opened if PPQ requires fumigation. PPQ is not responsible for opening or perforating the wrapping.

To expedite commodity movement, importers should send a complete bag/ wrap sample to CPHST-TMT for inspection and approval.

USDA-APHIS-PPQ-S&T-CPHST-TMT  
1730 Varsity Drive, Suite 300  
Raleigh, NC 27606  
919-855-7450

## Sorpton

Sorpton is the process of chemically or physically binding free MB on or within the fumigated commodity. Sorpton makes the fumigant unavailable to kill the plant pest. There are three types of sorpton—absorption, adsorption, and chemisorption. Sorpton rate is high at first, then gradually reduces to a slow rate. Sorpton increases the time required for aeration.

Commodities known or believed to be highly sorptive should not be fumigated in chambers unless concentration readings can be taken to ensure the required minimum concentration is met. Additional readings may be necessary in order to properly monitor gas concentration sorptive commodities in chambers.

For tarpaulin fumigation, additional gas readings are necessary to monitor concentration of gas to determine the rate of sorpton. The following is a partial list of commodities known to be highly sorptive:

- ◆ Burlap bales
- ◆ Carpet backing
- ◆ Cinnamon quills
- ◆ Cocoa mats
- ◆ Cotton
- ◆ Flour and finely milled products
- ◆ Gall nuts
- ◆ Hardboard (Masonite™)
- ◆ Incense
- ◆ Myrobalan
- ◆ Pistachio nuts
- ◆ Polyamide waste
- ◆ Polystyrene foam (Styrofoam)
- ◆ Potato starch
- ◆ Rubber (crepe or crude)
- ◆ Vermiculite
- ◆ Wood products (unfinished)
- ◆ Wool (raw, except pulled)

Contact CPHST-TMT if you are concerned about the sorptive properties of other commodities.

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## Residual Effect

MB may adversely affect the shelf life of fresh fruits and vegetables, the viability of dormant and actively growing plants, and the germination of seed. Although MB may adversely affect some commodities, it is a necessary risk in order to control pests. Some dosage rates are near the maximum tolerance of the commodity, so care must be exercised in choosing the proper treatment schedule and applying the treatment.

MB may also adversely affect nonplant products. In general, articles with a high sulfur content may develop “off-odors” on contact with MB. In some commodities the odors are difficult or impossible to remove by aeration. If possible or practical, remove from the area to be fumigated any items that are likely to develop an undesirable odor.

Ordinarily, the following items should **not** be fumigated:

- ◆ Any commodity **not** listed on the label or lacking a FIFRA Section 18 Exemption
- ◆ Any commodity lacking a treatment schedule
- ◆ Automobiles
- ◆ Baking powder
- ◆ Blueprints
- ◆ Bone meal
- ◆ Butter, lard, or fats, unless in airtight containers
- ◆ Charcoal (highly sorptive)
- ◆ Cinder blocks or mixed concrete and cinder blocks
- ◆ CO<sup>2</sup> scrubbers (calcium hydroxide and calcium carbonate; MAXtend<sup>®</sup>)<sup>3</sup>
- ◆ EPDM rubber (ethylene propylene diene M-class; a type of synthetic rubber)
- ◆ Electronic equipment<sup>4</sup>
- ◆ Ethylene absorbers (potassium permanganate sachets used to remove ethylene from an enclosure, usually a container loaded with fruit)
- ◆ Feather pillows
- ◆ Felt

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<sup>3</sup> If the scrubbers are removed prior to fumigation, the consignment may be fumigated.

<sup>4</sup> Electronic equipment may be fumigated as long as it is properly sealed to protect against internal fluid contamination by the MB gas. Ensure that the liquid MB is completely volatilized before it is introduced into the area to be fumigated. Obtain a waiver from the importer agreeing to release the USDA from any damages.

- ◆ Furs
- ◆ High-protein flours (soybean, whole wheat, peanut)
- ◆ Horsehair articles
- ◆ Leather goods
- ◆ Machinery with milled surfaces
- ◆ Magazines and newspapers (made of wood pulp)
- ◆ Magnesium articles (subject to corrosion)
- ◆ Paper with high rag or sulfur content
- ◆ Photographic chemicals and prints (**not** camera film or X-rays)
- ◆ Polyurethane foam
- ◆ Natural rubber goods, particularly sponge rubber, foam rubber, and reclaimed rubber including pillows, mattresses, rubber stamps, and upholstered furniture
- ◆ Neoprene
- ◆ Rug pads
- ◆ Silver polishing papers
- ◆ Woolens (especially angora), soft yarns, and sweaters; viscose rayon fabrics
- ◆ Yak rugs

# 2

Treatment Manual

## Chemical Treatments

### *Fumigants • Methyl Bromide • Chamber Fumigation*

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#### Contents

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#### Methods and Procedures

The procedures covered in this section provide commercial fumigators and chamber owners with the methods, responsibilities, and precautions for normal atmospheric pressure (NAP) and vacuum chamber fumigations.

The chamber owner is responsible for hiring a state certified fumigator and for ensuring that the chamber is certified for conducting PPQ quarantine treatments.

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#### 2016 Methyl Bromide Label Information

In 2015, the Environmental Protection Agency (EPA) directed all methyl bromide (MB) registrants to amend the use directions on the labels of all 100% MB products. EPA required the changes in order to reflect recommendations in an EPA report.<sup>1</sup>

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<sup>1</sup> "Report of Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for methyl bromide, and Reregistration Eligibility Decision (RED) for Methyl Bromide's Commodity Uses", dated August 2006.  
([https://archive.epa.gov/pesticides/reregistration/web/pdf/methyl\\_bromide\\_tred.pdf](https://archive.epa.gov/pesticides/reregistration/web/pdf/methyl_bromide_tred.pdf))

These amendments modify the use directions for fumigation and aeration procedures, modify respiratory requirements and equipment and update gas monitoring equipment. EPA requires all labels on newly manufactured MB to reflect these recommendations effective **October 01, 2016**; however, EPA is allowing existing stocks of MB to be used in accordance with the use directions on the existing stock's (older) labels.

PPQ officials and fumigators **must** closely examine gas cylinder labels in order to validate that the dosage, exposure, and commodity are either on the cylinder label or covered by a FIFRA Section 18 exemption. If a label is **not** affixed to the cylinder, DO NOT allow the fumigator to use that cylinder.

### New Buffer Zone Requirements

All 2016 MB labels now require both a treatment and an aeration buffer zone. Both the treatment and aeration buffer zones are specific to the enclosure being fumigated and must be determined by visiting a [website link<sup>2</sup>](#) provided in every MB label. The fumigators are responsible for using this website to determine the buffer zones and reporting both buffer zones to the PPQ official. If the treatment buffer zone is determined to be less than 30 feet, the PPQ official will maintain PPQ's standard 30 foot treatment buffer zone; otherwise, the new treatment buffer zone **must** be observed. If the aeration buffer zone is determined to be less than 200 feet, then PPQ's standard "200 feet for 10 minutes" aeration buffer zone **still** applies for the first 10 minutes of aeration.



USDA-APHIS granted the State of California a waiver from the 200' aeration buffer zone requirement provided the following criteria are met:

- ◆ The local CA Department of Pesticides or local Air Pollutions Department has issued a local permit allowing less than 200' aeration buffer zone.
- ◆ The permit applies **only** to a chamber with a vertical aeration stack.

USDA-APHIS may consider other waivers on a case-by-case basis.

The fumigator **must** refer to EPA's website to determine the minimum aeration buffer zone to be maintained until the aeration period is complete and the fumigator has verified that gas concentration levels meet the conditions in the MB label.

### Transiting through buffer zones

The label permits vehicles to transit through both treatment and aeration buffer zones under specific conditions found in the label; it is up to the fumigator determine how or whether vehicles may transit in accordance with the label.

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<sup>2</sup> <https://www.epa.gov/pesticide-registration/mbcommoditybuffer>

When using the newer 2016 MB label, changes to certain procedures and equipment in this chapter are displayed in a NOTICE box with a heading titled “MB 2016 Label”.

### MB 2016 Label (example)



Use this information when the fumigator is using the 2016 MB label.

When using existing stocks, follow the equipment and procedural guidance that is displayed in the body of the text (outside of the NOTICE box).

If there is no “MB 2016 Label” NOTICE box, then the instructions apply to all MB labels, 2016 and older.

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## Materials Needed

### PPQ Official Provides

- ◆ APHIS-approved leak detection device
- ◆ Calculator (optional)
- ◆ Forms (PPQ Form 429 and APHIS Form 2061 if necessary)
- ◆ Self-contained breathing apparatus (SCBA) or supplied air respirator

## MB 2016 Label



In addition to the bulleted list on [page 2-5-3](#), the PPQ official will provide:

- ◆ Air purifying respirator NIOSH certified half-mask or full face piece with a cartridge for concentrations between 1 and 4 ppm
- ◆ APHIS-approved continuous real time gas monitoring device
  - ❖ Permanently mounted in PPQ owned facilities only, PureAire Monitoring Systems, Inc. model Air check Advantage<sup>1</sup>
  - ❖ Portable Photoionization Detector (PID), RAE Systems, Inc. model MiniRAE 3000<sup>2</sup>
- ◆ Self contained breathing apparatus (SCBA) NIOSH approval prefix TC-13F or supplied air respirator NIOSH approval prefix TC-19C

- 1 The Air Check Advantage can be calibrated either by the manufacturer or by the PPQ official. Calibrate according to the manufacturer's User Guide. Refer to Chapter 8: Equipment for more information.
- 2 The MiniRae 3000 must be calibrated by the PPQ official according to the manufacturer's User's Guide. Refer to Chapter 8: Equipment for more information.

## Fumigator Provides

- ◆ APHIS-approved gas detection device<sup>3</sup> (e.g. thermal conductivity device, infrared device, etc.)
- ◆ APHIS-approved leak detection device
- ◆ Auxiliary pump for purging long gas sample tubes
- ◆ Carbon dioxide filter (e.g., Ascarite<sup>®</sup>)
- ◆ Colorimetric tubes (Refer to *Gas Detector Tube (colorimetric) and Apparatus* [on page E-1-32](#) for a list of APHIS-approved product ranges)
- ◆ Desiccant (e.g., Drierite<sup>®</sup>)
- ◆ Electrical wiring (grounded, permanent type), three prong extension cords
- ◆ Gas introduction line
- ◆ Heat supply

- 3 The methyl bromide monitor must be calibrated annually. Refer to Chapter 8: Equipment for calibration information. If using a thermal conductivity (TC) analyzer, Drierite<sup>®</sup> and Ascarite<sup>®</sup> must be used.

- ◆ Methyl bromide
- ◆ Scale or graduated cylinder for volume (liquid measurements)<sup>4</sup>
- ◆ SCBA or supplied air respirator
- ◆ Temperature recorder and temperature sensors<sup>5</sup>
- ◆ Thermometer<sup>6</sup>
- ◆ Volatilizer
- ◆ Warning signs/Placarding

### MB 2016 Label



In addition to the bulleted list on [page 2-5-4](#) and [page 2-5-5](#), the fumigator will provide:

- ◆ Air purifying respirator NIOSH certified half-mask or full face piece with a cartridge for concentrations between 1 and 4 ppm
- ◆ APHIS-approved continuous real time gas monitoring device<sup>1</sup>
  - ❖ Permanently mounted in PPQ owned facilities only, PureAire Monitoring Systems, Inc. model Air check Advantage
  - ❖ Portable Photoionization Detector (PID), RAE Systems, Inc. model MiniRAE 3000
- ◆ APHIS-approved direct read gas detection device
  - ❖ Colorimetric tubes (e.g. Draeger, Sensidyne)
- ◆ Self contained breathing apparatus (SCBA) NIOSH approval prefix TC-13F or supplied air respirator NIOSH approval prefix TC-19C

1 These devices must be calibrated according to the manufacturer's User Guide. Refer to Chapter 8: Equipment for more information.

4 All scales must be calibrated by the State, a company that is certified to conduct scale calibrations, or by the fumigator under the supervision of PPQ. The source and date of calibration must be posted in a visible location on or with the scale at all times. The scale must be calibrated a following every repair or minimum of every year.

5 Temperature sensors must be calibrated annually by the manufacturer or National Institute of Standards and Technology (NIST) within the range of 40 °F to 80 °F (4.4 °C to 26.7 °C)

6 The thermometer must be calibrated or replaced annually.

Refer to *Certification of Vacuum Fumigation Chambers* [on page 6-2-1](#) and *Certifying Atmospheric Fumigation Chambers* [on page 6-3-1](#) for guidelines on chamber certification.

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## Conducting the Fumigation

### Step 1—Selecting a Treatment Schedule

The PPQ official will select an appropriate treatment schedule to effectively eliminate the plant pest without damaging the commodity to be fumigated.

Turn to the treatment schedule Index and look up by commodity or by pest the treatment schedule(s) available. Treatment schedules which are approved for chambers will be listed as either “NAP” (normal atmospheric pressure) or as “vacuum.”

### Step 2—Issuing a PPQ Form 523 (Emergency Action Notification)

When an intercepted pest is identified and confirmed by a PPQ Area Identifier as requiring action, the CBP or PPQ official will issue a Form 523 (Emergency Action Notification - EAN) to the owner, broker, or representative. The EAN will list all treatment options. Refer to Appendix A in the *Manual for Agricultural Clearance* for instructions on completing and distributing the EAN.

### Step 3—Determining Section 18 Exemptions and Sampling Requirements

After selecting the treatment schedule, the PPQ official will determine which treatment schedules are FIFRA Section 18 Exemptions. The schedule will be followed by an “IMPORTANT” note to help you determine the current exemption status. Some treatment schedules are only FIFRA Section 18 Exemptions at specific temperature ranges. Check the treatment schedule and temperature to determine if the fumigation will be a FIFRA Section 18 Exemption.

Residue monitoring by taking samples of the commodity prior to the start of the fumigation and after aeration is no longer required.

## Step 4—Setting up the Fumigation Site

### MB 2016 Label

**NOTICE**

The PPQ official and the fumigator must select a secure area where traffic and people are restricted from entering and which is isolated from people working. A nonwork area is preferred to help prevent accidents.

The treatment and aeration buffer zones are determined by the fumigator in accordance with EPA’s fumigation buffer zone tables (<https://www.epa.gov/pesticide-registration/mbcommoditybuffer>).

The buffer zones surround the area where access is limited during treatment. If the fumigator determines that the buffer zone is less than 30’, then PPQ requires a 30’ buffer zone. If the fumigator determines that the buffer zone is greater than 30’, then PPQ must observe the prescribed buffer zone.

The treatment and aeration buffer zones extend from the perimeter of the enclosure to a distance determined by the fumigator in accordance with the label. Entry by any person except the PPQ official and the fumigator is **prohibited** except as provided in the “Exceptions to Buffer Zone Entry Restrictions” section of the label.

The treatment buffer zone begins when the fumigant is introduced into the enclosure and ends when aeration begins, at which point the aeration buffer zone requirements apply.

The fumigator must define the treatment and aeration buffer zone perimeters using physical barriers (such as walls, ropes, etc.) and placards to limit access to the buffer zone. Placards must meet all label requirements regarding specific warnings, information, and language.

The fumigator will permit transiting through buffer zones in accordance with the “Transit Exception” section of the label.

#### **Buffer Zone Overlap for Multiple Enclosures**

For multiple enclosures where buffer zones overlap, the fumigator must recalculate both the treatment and aeration buffer zones in accordance with the label and supply them to the PPQ official.

## Step 5—Measuring the Temperature

The PPQ official must determine the temperature of the commodity in order to select the proper dosage rate. Depending on whether or not you are fumigating a pulpy fruit or vegetable, you may use **either** the commodity temperature **or** an average of the commodity and air temperatures. A pulpy fruit or vegetable can support internal feeding insects, is fleshy and moist, and can be probed with a temperature measuring device. Examples include, but are not limited to peppers, onions, and grapes.

Determine the temperature to use in selecting the proper dosage rate:

- ◆ For fruits, pulpy vegetables, or logs use only the commodity temperature.
- ◆ For all other commodities use both the commodity and air temperature.

To take the temperature readings, use a bimetallic, mercury, or digital long-stem thermometer that has been calibrated. Use **Table 2-5-1** to determine which temperature to use when selecting the proper dosage rate for commodities other than fresh fruits, vegetables, or logs. Record the temperatures in Block 22 of the PPQ Form 429.

If using the electronic 429 database, record the temperatures in the space and commodity fields in the Treatment form.



The presence of ice indicates temperatures below 40 °F. If ice is present anywhere in the box, pallet, or fumigation enclosure, **DO NOT** fumigate the commodity.



Commodity and space temperatures must be 40 °F or above.

**Table 2-5-1 Determine Whether to Use Commodity or Air Temperature for Determining Dosage Rate**

If the air temperature is:	And:	Then, for commodities other than fresh fruits or vegetables or logs and lumber <sup>1</sup> :
Higher than the commodity temperature	→	Use the single lowest commodity temperature for determining the dosage rate (Do Not use the average commodity temperature).
Lower than the commodity temperature	By less than 10 degrees	Use the average of the single lowest air and commodity temperature for determining the dosage rate
	By 10 degrees or more	

<sup>1</sup> Use commodity temperature for fresh fruits or vegetables or logs and lumber.

### Step 6—Calculating the Dosage

In order to calculate dosage, the PPQ official must have the following information:

- ◆ Treatment schedule
- ◆ Volume of the fumigation chamber (ft<sup>3</sup>)
- ◆ Temperatures of commodity and air ( °F)

The PPQ official must refer to the specific treatment schedule to determine the dosage rate (pounds/ft<sup>3</sup>).

Use the formula in [Figure 2-5-1](#) to calculate the dosage:

$$\begin{aligned} \text{dosage (lbs.)} &= \text{volume (ft}^3\text{)} \times \text{dosage rate (lbs./1,000 ft}^3\text{)} \\ &= \frac{\text{volume (ft}^3\text{)} \times \text{dosage rate (lbs.)}}{1,000 \text{ ft}^3} \end{aligned}$$

**Figure 2-5-1 Formula for Calculating Dosage for Chamber Fumigations**

---

EXAMPLE: Using a fumigation chamber which has a volume of 500 ft<sup>3</sup>, you determine the temperature of the commodity and space is 72 °F. The treatment schedule requires 2 lbs. MB/1,000 ft<sup>3</sup> at 70 °F or above. To calculate dosage multiply the volume (500 ft<sup>3</sup>) by the dosage rate (2 lbs. MB/1,000 ft<sup>3</sup>). This equals 1.0 lbs. of MB needed for the dosage.

---

### Step 7—Conducting the Fumigation

Since fumigation chambers vary by manufacturer and model, refer to the manufacturer's operating manual to determine how to use the chamber. In NAP chambers, circulation fans **must** run for 15 minutes following introduction of the gas.

Taking concentration readings is **not** required when conducting chamber fumigations.

### Step 8—Leak Detection

Turn on any leak detection devices prior to gas introduction and ensure that they run throughout the entire fumigation and aeration.

---

## Aerating the Chamber

The fumigator must:

- ◆ Arrange for the aeration to proceed once the treatment is completed.

- ◆ Consider the direction of the wind when pointing the exhaust duct, and face the duct outlet toward an open area away from people.
- ◆ Ensure that, during the first 10 minutes of aeration, no one is present within 200 feet downwind of the exhaust duct outlet. (see California waiver details on [page 2-5-2](#))
- ◆ Determine aeration buffer zones in accordance with EPA’s fumigation buffer zone tables (<https://www.epa.gov/pesticide-registration/mbcommoditybuffer>).
- ◆ Ensure that no one is present within the perimeter of the aeration buffer zone unless they are wearing SCBA.
- ◆ **See “Buffer Zone Overlap for Multiple Enclosures” on page-2-5-7.**
- ◆ Follow all label instructions, state, county, and local regulations, in addition to the instructions in this manual.
- ◆ Inform people located in occupied structures and personnel in the immediate area within the buffer zone that release of MB is about to take place and give them the option of leaving the area or remaining inside the building.
- ◆ Restrict access to the area where the exhaust duct extends beyond the enclosure.
- ◆ Secure the fumigation area and allow only the chamber operator and the PPQ official monitoring the fumigation into the secure area.



Do **not** allow motorized vehicles to operate within the secure area.

---

## Responsibility for Aerating the Commodity

Responsibility for aerating the chamber and releasing the commodity depends on whether the treatment schedule used was a labeled use or FIFRA Section 18 Exemption. Use [Table 2-5-2](#) to determine responsibility for aerating the commodity

**Table 2-5-2 Determine the Responsibility for Aerating the Commodity During Chamber Fumigations**

If the fumigation chamber is:	And the treatment schedule is:	Then:
Privately or State owned	A labeled treatment	RELEASE the fumigation to the fumigator to aerate and release the commodity.
	A FIFRA Section 18 Exemption (noted in the treatment schedules)	1. PPQ official must be present at the initiation of aeration and to verify the final aeration readings
PPQ owned	—————▶	2. USE <a href="#">Table 2-5-3</a> to determine which aeration procedures to follow.

**Table 2-5-3 Determine the Aeration Procedure for Chamber Fumigations**

If the chamber is:	Then:
NAP	Use the procedures on <a href="#">page 2-5-12</a>
Vacuum	Use the procedures on <a href="#">page 2-5-12</a>

Each chamber must be equipped with at least one permanent, metal gas sampling tube to allow the fumigator to take colorimetric tube readings during the aeration. Any extensions of the gas sampling tube or flexible connectors must be made of Teflon™ tubing or metal. The extensions of the sampling tube must run from an area in between the treated boxes and end outside the chamber to allow for colorimetric tube readings.

## Wearing Respiratory Protection

The fumigator must wear approved respiratory protection (SCBA, supplied air respirator, or combination unit) when there is a risk of exposure to concentrations above 5 ppm; this includes any time the concentration is unknown.

### MB 2016 Label



If MB concentration levels are between 1-4 ppm, the PPQ official and the fumigator may wear an air purifying respirator NIOSH certified half-mask or full face piece with a cartridge.

## Normal Atmospheric Pressure Chamber—Aerating Noncontainerized Cargo

Advise the fumigator to:

1. While wearing SCBA, turn on the chamber fans.
2. Aerate a minimum of 3 hours for all commodities.
3. Stop the fans and take concentration readings with colorimetric tubes in the airspace around the box and, when feasible, within the carton or box.

Use [Table 2-5-4](#) to determine when to release the commodity.

**Table 2-5-4 Determine When to Release the Commodity After NAP Fumigation**

If the gas concentration level is:	Then:
5 ppm or less	<ol style="list-style-type: none"><li>1. CONTINUE aeration for 30 minutes.</li><li>2. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less.</li><li>3. RELEASE the commodity</li></ol>
6 ppm or more	<ol style="list-style-type: none"><li>1. REQUIRE the fumigator to conduct two additional air washes.</li><li>2. TAKE gas concentration readings.</li><li>3. If concentration readings are 5 ppm or less, CONTINUE aeration for 30 minutes.</li><li>4. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less.</li><li>5. RELEASE the commodity.</li></ol>

For FIFRA Section 18 exemptions, record the concentration reading (in ppm), date, and time in Block 39 of PPQ Form 429. If using the electronic 429 database, record the date, time and detector reading (in ppm) in the “Detector Readings” form.

---

## Vacuum Fumigation Chambers—Aerating Containerized and Noncontainerized Cargo

Advise the fumigator to:

1. Adjust any vacuum remaining at the end of the fumigation to zero by temporarily opening the air intake valve, then closing it.
2. Draw a 15 inch vacuum and adjust it to zero.
3. Repeat this process of drawing a 15 inch vacuum and releasing it a **minimum** of four times.

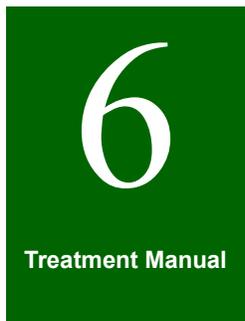
4. Take concentration readings using a colorimetric tube in the airspace around the box, and when feasible, **within the carton or box.**

For FIFRA Section 18 exemptions, record the concentration reading (in ppm), date, and time in Block 39 of PPQ Form 429. If using the electronic 429 database, record the date, time and detector reading (in ppm) in the “Detector Readings” form.

Use [Table 2-5-5](#) to determine when to release the commodity.

**Table 2-5-5 Determine When to Release the Commodity After Vacuum Fumigation**

If the gas concentration is:	Then:
5 ppm or less	<ol style="list-style-type: none"> <li>1. CONTINUE aeration for 30 minutes.</li> <li>2. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less.</li> <li>3. RELEASE the commodity</li> </ol>
6 ppm or above	<ol style="list-style-type: none"> <li>1. REQUIRE the fumigator to conduct two additional air washes.</li> <li>2. TAKE gas concentration readings.</li> <li>3. If concentration readings are 5 ppm or less, CONTINUE aeration for 30 minutes.</li> <li>4. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less.</li> <li>5. RELEASE the commodity.</li> <li>6.</li> </ol>



# Certifying Facilities

## *Certification of Cold Treatment*

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### Introduction

Since the early 1900s, sustained cold temperature has been employed as an effective post-harvest method for the control of the Mediterranean and certain other tropical fruit flies. Exposing infested fruit to temperatures of 2.2 °C (36 °F) or below for specific periods of time results in the mortality of the various life stages of this group of notoriously injurious insects. Procedures were developed to effectively apply cold treatment (CT) to fruit while in transport in refrigerated holds of ships, in refrigerated containers, and in warehouses located in the country of origin or in the United States.

Self-refrigerated (Integral) containers, conventional vessels, and warehouses utilized for regulatory cold treatment are subject to approval by the USDA. Approval is needed only when treating fruit under USDA regulations and does **not** constitute an endorsement for the carrying or storage of refrigerated cargo.

Only officials authorized by APHIS have permission to conduct warehouse, vessel or container certification under the general guidance of CPHST-TMT. Refer to the following web site for a complete list of USDA-certified vessels and containers for intransit cold treatment:

<https://treatments.cphst.org/vessels/>

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## Standards for Temperature Recording Systems

Temperature recording systems may consist of various electronic components such as temperature sensors, computers, printers, and cables and are required for temperature recording installations in cold treatment vessels, refrigerated containers, or warehouses. Submit plans and specifications of the temperature recording system to **USDA-APHIS-PPQ-CPHST-TMT** for review and approval before installation.

### Temperature Recording System

- ◆ **Accuracy**—The accuracy of the system must be within plus or minus 0.3 °C (0.5 °F) of the true temperature in the range of minus 3 °C (27 °F) to plus 3 °C (37 °F).
  - ❖ Ensure the instrument is capable of repeatability in the range of minus 3 °C to plus 3 °C (27 °F to 37 °F.)
- ◆ **Automatic Operation**—The system must be capable of automatic operation whenever the treatment system is activated.
- ◆ **Long-Term Recording**—The system must be capable of continuous recording of date, time, sensor number, and temperature during all calibrations and for the duration of a voyage and/or treatment period.
- ◆ **Password Protection**—All approved temperature recording devices must be password protected and tamper-proof.
- ◆ **Recording Frequency**—The time interval between prints will be no less than **once every hour**. For each sensor, the temperature value, location/identification, time and date must print **once per hour**.
- ◆ **Repeatability**—When used under treatment conditions over an extended period of time, the system must be capable of repeatability in the range of minus 3 °C to plus 3 °C (27 °F to 37 °F.) The design, construction and materials must be such that the typical environmental conditions (including vibration) will **not** affect performance.

- ◆ **Range**—The recorder must be programmed to cover the entire range between minus 3 °C to plus 3 °C (27 °F to 37 °F), with a resolution of 0.1 (°C or °F.)
- ◆ **Visual Display**—The system must have a visual display so the temperature can be reviewed manually during the treatment and calibrations.

## Temperature Sensors

- ◆ **Construction Standards**—Sensors should have an outer sheath diameter of 0.25 inches (6.4 millimeters) or less. The sensing unit must be in the first inch of the sensor.
- ◆ **Identification**—Identify all sensors to distinguish the sensors in one compartment from those in other compartments.
  - ❖ Place an identifying number on the box where the sensor originates and on a permanent tag where the cable joins the sensor.
  - ❖ Identify the sensors for each compartment so the air sensors are numbered first (e.g., A1, A2—air; A3, A4,..., etc.,—fruit pulp.)
- ◆ **Location**—Post a diagram next to the recording instrument that shows the location and identification of each sensor by compartment.
  - ❖ Air sensors—Place sensors on the center line of the vessel, fore and aft, approximately 30 centimeters from the ceiling and connected to cables at least 3 meters in length
  - ❖ Fruit sensors—Distribute fruit sensors throughout the compartment so all areas of the compartment can be reached (5- to 15-meter cable lengths are usually sufficient.) The number and location is dependent upon cubic capacity of the compartment. Refer to **Figure 6-4-1 on page-6-4-6** for guidance for vessels and **Figure 6-4-6 on page-6-4-15** for guidance for warehouses. Three temperature sensors are required for refrigerated containers. These are labeled USDA1, USDA2, and USDA3.

Contact [USDA-APHIS-PPQ-CPHST-TMT](#) for a complete list of approved temperature recording systems.

## Certification of Warehouses Used for Cold Treatment

The local APHIS-PPQ inspector will certify refrigerated warehouses for use as cold treatment facilities before treating fruit under USDA regulations. In addition to the general requirements, warehouse approval is subject to specific geographical pest-risk considerations as outlined in Title 7, Section 305.6 of the Code of Federal Regulations.

**USDA-APHIS-PPQ-CPHST-TMT** will approve plans and specifications prior to the initial warehouse certification. Conduct a performance survey prior to the warehouse receiving approval to conduct cold treatments under USDA regulations.

### Plan and Specification Approval

Prior to the start of warehouse construction, submit a completed Application for Warehouse Approval, detailed drawings of the physical characteristics, and a written description of the all the treatment related equipment to **USDA-APHIS-PPQ-CPHST-TMT**. All plans and supporting materials must be submitted in Standard English. An example of a completed Application is provided in **Figure 6-4-7 on page-6-4-18**.

Include the following information in the Application:

- ◆ Address of the warehouse location
- ◆ Drawings showing the dimensions, cubic capacity and door locations



Drawings may be hand-drawn, but must clearly show location of refrigeration units, circulation fans, temperature recorder, and sensors.

- ◆ Make and model of the refrigeration equipment
- ◆ Name and address of the firm owning the warehouse chamber
- ◆ Number and location of sensors (**Figure 6-4-6 on page-6-4-15**)
- ◆ Method for segregating fruit under treatment and securing it from other foreign or domestic articles
- ◆ Specification of the air circulation system; must indicate the number of air changes and direction of air flow
- ◆ Specifications of the recording system

### Certification Testing

When all documents and a completed Application have been submitted and approved by the **USDA-APHIS-PPQ-CPHST-TMT**, the warehouse owner should make the warehouse available for an on-site certification visit by a

local PPQ official. To arrange warehouse certification, contact the State Plant Health Director or Officer-In-Charge for the port. Before requesting final inspection, the warehouse owner must complete all arrangements as directed by the PPQ officer. The PPQ official will conduct calibration and identification tests during the inspection.

**Determining the Number of Temperature Sensors**

The number and location of temperature sensors is based on the cubic capacity. Refer to **Figure 6-4-6** to determine the number and location of sensors. The minimum requirement is three sensors—one air sensor and two pulp sensors. Sensor cables must be long enough to reach all areas of the load.

Cubic Feet	Cubic Meters	Number of Pallets	Number of Air Sensors	Number of Pulp Sensors	Total Number of Sensors
0 to 10,000	0 to 283	1 - 100	1	2	3
10,001 to 20,000	284 to 566	101 - 200	1	3	4
20,001 to 30,000	567 to 849	201 - 300	1	4	5
30,001 to 40,000	850 to 1132	301 - 400	1	5	6
40,001 to 50,000	1133 to 1415	401 - 500	1	6	7
50,001 to 60,000	1416 to 1698	501 - 600	1	7	8
60,001 to 70,000	1699 to 1981	601 - 700	1	8	9
70,001 to 80,000	1982 to 2264	701 - 800	1	9	10
80,001 to 90,000	2265 to 2547	801 - 900	1	10	11
90,001 to 100,000	2548 to 2830	901 - 1000	1	11	12
Over 100,000	>2830	1000 +	Must be approved by CPHST-TMT		

**Figure 6-4-6 Number of Sensors in a Warehouse**



If a refrigerated room is equipped according to the cubic capacity of the storage area (rather than of the load itself), the same criteria apply.

It is highly recommended that additional sensors beyond the required minimum be installed.

**Calibration of Temperature Sensors**

Calibrate all temperature sensors using a freshwater ice water slurry at 0 °C (32 °F).



It is APHIS policy to use the standard "rounding rule". In determining calibration factors, if the reading is .05 or higher, round to the next higher number in tenths. If it is .04 or lower, round to the lower number. For example: If the calibration factor was .15, round to .2. If it was .32, round to .3. Similar rounding can be used in actual treatment readings. If an actual reading was 34.04, round to 34.0, add or subtract the calibration factor, if necessary. If it was 34.07, round to 34.1, add or subtract the calibration factor, if necessary.

Use the following steps to make the ice water slurry:

1. Prepare a mixture of clean ice and fresh water in a clean insulated container.
2. Crush or chip the ice and completely fill the container.
3. Add enough water to stir the mixture.
4. Stir the ice and water for a minimum of 2 minutes to ensure the water is completely cooled and good mixing has occurred.
  - ❖ The percentage of ice is estimated at 80 to 85 percent while the water fills the air voids (15 to 20 percent).
5. Add more ice as the ice melts.
6. Prepare and stir the ice water slurry to maintain a temperature of 32 °F. (0 °C)
7. Submerge the sensors in the ice water slurry without touching the sides or bottom of the container.
8. Stir the mixture.
9. Continue testing of each sensor in the ice water slurry until the temperature reading stabilizes.
10. Record two consecutive readings of the stabilized temperature on the temperature chart or logsheet.
  - ❖ The temperature recording device should be in manual mode to provide an instantaneous readout.
11. Allow at least a 1 minute interval between two consecutive readings for any one sensor; however, the interval should **not** exceed 5 minutes.
  - ❖ The variance between the two readings should **not** exceed 0.1°.
12. Contact an instrument company representative immediately if the time interval exceeds the normal amount of time required to verify the reading and accuracy of the sensor and recorder system
  - ❖ The recorder used with the sensors must be capable of printing or displaying on demand and **not** just at hourly intervals.
13. Correct any deficiencies in the equipment before certification.
14. Replace any sensor that reads more than plus or minus 0.3 °C (0.5 °F) from the standard 0 °C (32 °F).
15. Replace and recalibrate any sensors that malfunction.
16. Document the recalibration and replacement of the sensor(s) on the PPQ Form 449-R, Temperature Recording Calibration Report.
17. Determine the calibrations to the nearest tenth of one degree.

**Frequency of  
Certification  
Testing**

A certification test is required every year. Submit requests for recertification to the local PPQ office at least 60 days before expiration. Certification testing is also required anytime a malfunction, breakdown or other failure occurs (excluding temperature sensors) that requires modifications to the recording and monitoring system(s).

## Application for USDA Warehouse Approval

Visit the [Commodity Treatment Information System](#) web site or contact **USDA-APHIS-PPQ-CPHST-TMT** for a fillable, electronic Vessel Approval Application.

**APPLICATION FOR USDA WAREHOUSE APPROVAL**  
FOR USE IN CONDUCTING QUARANTINE COLD TREATMENTS UNDER USDA REGULATIONS

Instructions:

- (1) Use one application for each warehouse.
- (2) Review the regulatory requirements in Chapter 6 of the Plant Protection and Quarantine (PPQ) Treatment Manual. An electronic PDF document of the manual is available at the following website: [http://www.aphis.usda.gov/import\\_export/plants/manuals/ports/downloads/treatment.pdf](http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment.pdf)
- (3) Each application must include technical documents that support the information supplied.
- (4) Fill in each field of the application completely. Review of the application will not begin until all information is received. If a field is not applicable, please put "N/A" in the space provided. In the column labeled "Reference", indicate the page number(s) or specific location where the information can be found in the supporting technical documents.
- (5) Send the completed application and required additional information (manuals, technical sheets) to the following office:

**USDA-APHIS-PPQ-CPHST AQI Raleigh**  
1730 Varsity Drive, Suite 300  
Raleigh, North Carolina 27606 USA  
Fax: (919) 855-7493

1. Contact Information	
<b>Requestor Information: This information will be used by USDA as the official contact information for this warehouse.</b>	
Name of Company <p style="text-align: center;">John Smith</p>	Name and Title of Requestor <p style="text-align: center;">Bilco Cold Products</p>
Address of Requestor: <p style="text-align: center;">1700 Dock Street Philadelphia PA 12345</p>	
Telephone: 800-555-5555	FAX: 800-555-5556
E-Mail Address:	
Agent Responsible for the Warehouse (if different from Requestor)	
Name of Agent	
Address of Agent:	
Telephone:	Fax:
E-Mail Address:	
2. Warehouse Information	
Name of Warehouse: Bilco Building 14	
Address: <p style="text-align: center;">123 Harbour Street Gloucester City, NJ 14567</p>	
Telephone: 800-565-1234	FAX: 800-565-1235
E-Mail Address: jsmith@bcp.com	Company Website: www.bcp.com

Form T-CT-W-A-123

Approved on 3/23/2009

Revision: 01  
Page 1 of 3

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**Figure 6-4-7 Example of a Completed Application for USDA Warehouse Approval, page 1 of 3**

Requirement		Reference Page or Section	
<b>(a) Delineations of treatment areas to be certified</b>			
		See page 5	
<b>(b) Cubic capacity of each treatment area to be certified</b>			
		See page 3	
<b>(c) Total cubic capacity of warehouse</b>			
		See page 2	
<b>(d) Sensor location</b>			
		See page 4	
<b>(e) Sensor number</b>			
		See page 4	
<b>(f) Sensor type (air or pulp)</b>			
		See page 1	
<b>(g) Treatment area identifiers</b>			
		See page 2	
<b>(h) Airflow direction</b>			
		See page 1	
<b>(i) Refrigeration unit location</b>			
		See page 1	
<b>(j) Recorder location</b>			
		See page 1	
<b>Also attach a description of the method used to segregate fruit under PPQ treatment from other foreign or domestic articles.</b>			
<b>3. Refrigeration Unit</b>			
Make of Refrigeration Unit: Carrier		Model of Refrigeration Unit: GSE	
Location of Refrigeration Unit: Equipment Room 1		Model Year: 1998	
Airflow maximum rate (cfm): 1250		Airflow direction: East to West	
<b>4. Temperature Recorder</b>			
Manufacturer: ACR		Model: Smart Recorder	Model Year: 2005
Serial number(s): 123545647899, 1234564789, 123789456			Quantity of recorders:
Location of unit(s): Portable			
Accuracy: Recorder (Must be accurate to within +/- 0.15 C in the range of +/- 3.0 C): 0.1 Recorder plus Sensor (Must be accurate to within +/- 0.30 C in the range of +/- 3.0 C): 0.3			
Is this a USDA approved recorder?: Yes			
<b>5. Temperature Sensors</b>			
Manufacturer: ACR		Model: 105	Model Year: 2005
Accuracy (Must be accurate to within +/- 0.15 C in the range of +/- 3.0 C): 0.1			
Length of sensor cable (must be long enough to reach fruit in all parts of the stack): 15 meters			
Do sensor numbers matches the numbers on the recorder: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			

X \_\_\_\_\_  
Requestor's Signature

\_\_\_\_\_ Date (mm-dd-yyyy)

Form T-CT-W-A-123 Approved on 3/23/2009 Revision: 01  
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**Figure 6-4-8 Example of a Completed Application for USDA Warehouse Approval, page 2 of 3**



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## Contact Information

### **USDA-APHIS-PPQ-CPHST-TMT**

1730 Varsity Drive

Suite 300

Raleigh, NC 27606

Phone: 919-855-7450

FAX: 919-855-7493

Email: [cphst.tqau@aphis.usda.gov](mailto:cphst.tqau@aphis.usda.gov)



## APPENDIX B

# MIA Fumigation Site Visit (Termite Doctor)

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**MDAD On-Call**

May 17, 2018

Fumigation and Engine Test Cell Facilities – Site Visit

8:00 AM – 11:30 AM

**17-04-1027 – Miami On-Call Services****On-Site**

<b>Facilitator:</b>	George Garcia	<b>Note takers:</b>	Estelle Boudassou
<b>Attendees:</b>	<b>Representing</b>	<b>Email</b>	<b>Phone Number</b>
Renee Bergeron	MDAD Planning	RBergeron@miami-airport.com	(305) 869-4849
Audwyn Francis	MDAD Planning	AFrancis@miami-airport.com	(305) 876-0367
Juan Prieto	Nova Consulting	jprieto@nova-consulting.com	-
Luis Lopez-Blazquez	Nova Consulting	llopez@nova-consulting.com	-
Cynthia Estivil	Nova Consulting	cestivil@nova-consulting.com	(305) 436-9200 x239
Thomas Carlson	M C Harry Architects	tcarlson@mcharry.com	-
Larry Arrington	M C Harry Architects	larrington@mcharry.com	(305) 445 3765 x127
Esther Monterrey	M C Harry Architects	emonterrey@mcharry.com	-
Ernie Aloma	SDM	erniea@sdmcorp.com	-
George Garcia	R&A	ggarcia@ricondo.com	(954) 494-4883
Estelle Boudassou	R&A	eboudassou@ricondo.com	(305) 260-2727 x257

**Discussion Points****Fumigation and Test Cell Facilities - Proposed Site**

The proposed site is located along the corner of Milan Dairy Road and Corporate Way, west of the end of Runway 9-27. The site is currently covered with dense vegetation (see **Exhibit 1**).

During the visit, the attendees mentioned their concern to have an engine test cell facility built at the end of a runway which would potentially impact and threaten approaches and landings on that specific runway.

**Exhibit 1: Proposed Fumigation and Test Cell Site**

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

## Fumigation Facility - Termite Doctor

### *Site Description*

Termite Doctor's site is located at the east end of NW 25<sup>th</sup> St.. It includes 2 trailers, 12 fumigation stations and 1 transload station (see **Exhibits 2, 3, and 4** below).

The facility operates 24/7 but by appointment outside of the regular working hours (the gate closes at 9PM).

### Exhibit 2: Employee and USDA Trailers



SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

### Exhibit 3: Fumigation Stations



SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

**Exhibit 4: Transload Station**

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

*Fumigation Process*

Each truck is assigned to one of the fumigation stations which includes a panel that is connected through a pipe to the USDA trailer (see **Exhibit 2**) and a gas inlet tube required for the fumigation itself. The panel combines a pair of 4 tubes directly plugged into the truck/container, thus collecting the information/results that are sent to the USDA trailer for analysis.

The fumigation process consists of the following:

- Check that the container can hold the gas pressure (it needs to hold the gas more than 15 seconds),
- Fumigate the truck for 2 to 4 hours depending of the type of load (200 pounds gas tanks are used (see **Exhibit 5**) and regular containers have a 10 to 15 pounds gas tank usage),
- Open the truck and aerate with a 200' radius offset for the first 30 minutes,
- Once the truck is checked and cleared by USDA, it can be collected. When the fumigation is over and if a truck needs to be moved to free up one of the stations, the employees would be able to do so.

**Exhibit 5: Gas Inlet**

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Trucks can be fumigated side to side (with a 30' offset) but not simultaneously. The facility can perform fumigation on 7 to 8 trucks at once and can have up to 30 trucks a day. Overall a truck can stay up to 7 hours at the facility.

Regarding seaport containers, those are most likely stacked on top of each other in which case they would need to be transloaded. The transload operation is performed in a closed environment and fans are used to avoid overheating (see **Exhibit 6**).

**Exhibit 6: Transload Station Interior**

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

*Working Conditions*

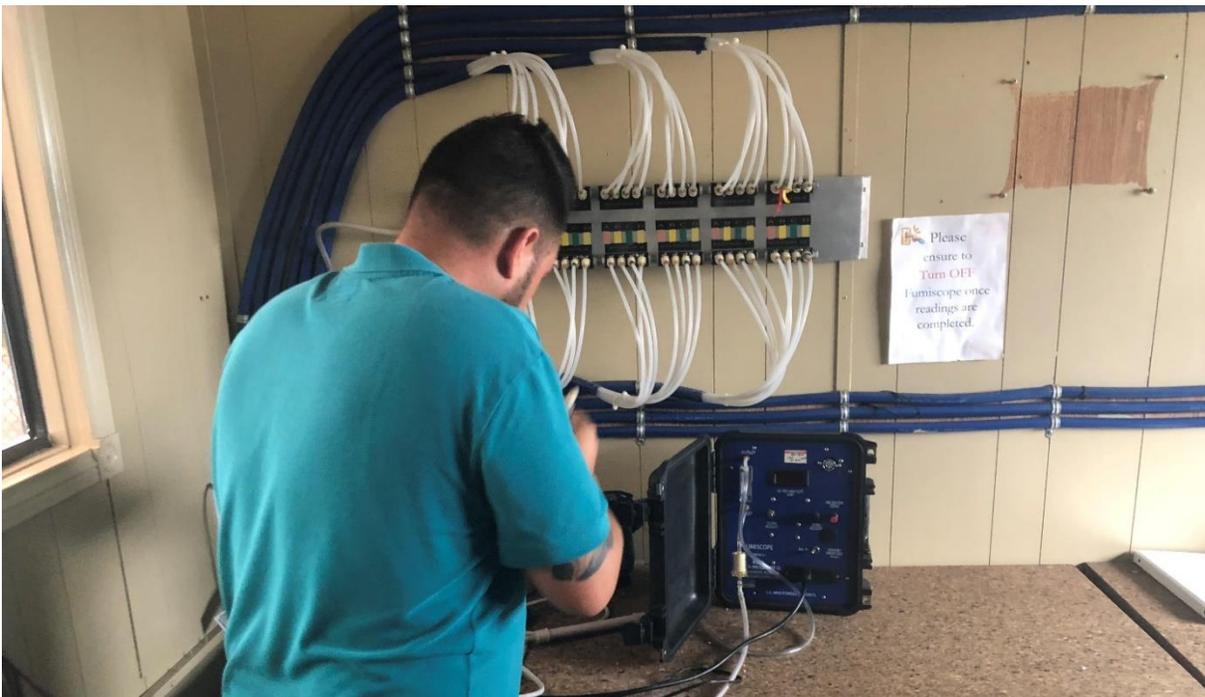
The facility operates with up to 3 or 5 USDA officers at the busiest times. Each officer can work on 5 trucks at once if required. They are reading and analyzing the data from their position using both visual and radio

communication to coordinate with the employees fumigating (see **Exhibit 7**). Additionally, each officer keeps a log of all the gathered data.

The USDA trailer is equipped with offices, computers, one bathroom, and WIFI (often deficient).

The fumigation employees' trailer has one bathroom and extra equipment storage but lacks sitting, resting and sleeping areas.

#### Exhibit 7: USDA Officer Position



SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.





## APPENDIX C

American Consolidation and Logistics –  
Fumigation Facility Plan (Miami-Dade  
County Regulatory and Economic  
Resources Department Microfilm Section)

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ELECTRICAL SYMBOL TABLE			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE 20 AMP/125 VOLT		TELEPHONE OUTLET
	DUPLEX RECEPTACLE 20 AMP/125 VOLT		DATA/PHONE OUTLET
	DUPLEX RECEPTACLE 20 AMP/125 VOLT		TELEPHONE JUNCTION BOX WALL MOUNT
	GFCI DUPLEX RECEPTACLE 20 AMP/125 VOLT		DATA JUNCTION BOX WALL MOUNT
	WEATHER-RESISTANT GFCI DUPLEX RECEPTACLE 20 AMP/125 VOLT		POWER JUNCTION BOX WALL MOUNT
	DUPLEX RECEPTACLE 20 AMP/125 VOLT		JUNCTION BOX 4\"/>
	DUPLEX RECEPTACLE 20 AMP/125 VOLT		TELEVISION OUTLET
	QUAD RECEPTACLE 20 AMP/125 VOLT		POWER POLE
	GFCI QUAD RECEPTACLE 20 AMP/125 VOLT		DISCONNECT
	SINGLE RECEPTACLE 20 AMP/125 VOLT		MOTOR STARTER
	CLOCK HANGER RECEPTACLE 20 AMP/125 VOLT		VARIABLE FREQUENCY DRIVE
	EQUIPMENT RECEPTACLE 120/208/277/480 VOLT		PIN-AND-SLEEVE RECEPTACLE
	SWITCH, SINGLE POLE 20 AMP/120-277 VOLT		EXHAUST FAN/MOTOR
	SWITCH, DOUBLE POLE 20 AMP/120-277 VOLT		LIGHTING CONTACTOR
	SWITCH, THREE-WAY 20 AMP/120-277 VOLT		CARD READER / KEYPAD
	SWITCH, FOUR-WAY 20 AMP/120-277 VOLT		INTERCOM
	SWITCH, DIMMER 120-277 VOLT		SECURITY DEVICE
	SWITCH, FAN DIMMER 120 VOLT RHOESTAT		MONITOR CAMERA
	SWITCH, MOTOR RATED 120-277 VOLT		ALARM CONTACTS
	SWITCH, KEY 20 AMP/120-277 VOLT		DOOR BUZZER
	TIME SWITCH OVERRIDE MAXIMUM SETTING OF 4 HOURS		LOW VOLTAGE CEILING MOUNTED SPEAKERS
	DIMMING PANEL OVERRIDE MAXIMUM SETTING OF 4 HOURS		DENOTES FLOOR OR ROOF MOUNT
	SWITCH, OCCUPANCY SENSOR 20 AMP/120-277 VOLT		DENOTES CEILING MOUNT
	SWITCH, OCC. SENSOR, 2-POLE 20 AMP/120-277 VOLT		DENOTES CORD DROP DEVICE
	SWITCH, OCC. SENSOR, 2-POLE, FAN 20 AMP/120-277 VOLT		
	SWITCH, OCC. SENSOR, SEMI AUTO. 20 AMP/120-277 VOLT		
	SWITCH, VACANCY SENSOR 20 AMP/120-277 VOLT		
	OCCUPANCY SENSOR, CORRIDOR 20 AMP/120-277 VOLT		
	OCC. SENSOR, WIDE VIEW, CORNER 20 AMP/120-277 VOLT		
	OCCUPANCY SENSOR, CEILING 20 AMP/120-277 VOLT		
	OCCUPANCY SENSOR, CEILING, 2-POLE, 20 AMP/120-277 VOLT		
	OCCUPANCY SENSOR, CEILING LOW VOLTAGE		
	OCCUPANCY SENSOR, HIGH BAY 20 AMP/120-277 VOLT		
	OCCUPANCY SENSOR, HIGH BAY LOW VOLTAGE		
	POWER PACK 20 AMP/120-277 VOLT		
	POWER PACK, 2-POLE 20 AMP/120-277 VOLT		

U.N.O. - UNLESS OTHERWISE NOTED

LIGHTING FIXTURE SCHEDULE						
TYPE	MANUFACTURER	NUMBER	MOUNT	VOLT	LAMPS	REMARKS
A	WILLIAMS	92-8-232-DR-EB4-UNV	SURFACE	277	4-F32T8	8' VAPOR TIGHT
A1	WILLIAMS	92-8-232-DR-EB4-EM1400T8-UNV	SURFACE	277	4-F32T8	8' VAPOR TIGHT W/ BATTERY BACK-UP
X	BEGHELLI	WLX-LR-1-W-SA-IH	UNIVERSAL	DUAL	LED	EXIT SIGN - W/ BATTERY BACK-UP

### GENERAL ELECTRICAL NOTES

- ALL ELECTRICAL WORK PERFORMED UNDER THIS CONTRACT SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC) 2008, LOCAL CODES AND ORDINANCES (INCLUDING THE 2010 FLORIDA BUILDING CODE (F.B.C.) WITH LATEST SUPPLEMENTS & AMENDMENTS) AND ALL STANDARDS OF CONSTRUCTION ESTABLISHED BY THE LANDLORD.
- PRIOR TO BID OR COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VISIT THE JOB SITE AND EVALUATE ALL EXISTING FIELD CONDITIONS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER OF ANY DISCREPANCIES. THE CONTRACTOR SHALL QUALIFY THE BID ACCORDINGLY.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ACCEPTANCE BY THE ARCHITECT AND/OR ENGINEER BEFORE PROCEEDING WITH THE PURCHASE OR INSTALLATION OF THE EQUIPMENT AND MATERIALS. NO FACSIMILES OR FACSIMILE COPIES SHALL BE ACCEPTED.
- THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO CUTTING OR DRILLING ANY STRUCTURAL SUPPORT MEMBER.
- THE CONTRACTOR SHALL SATISFACTORILY REPAIR/REPLACE ANY EQUIPMENT OR PART OF STRUCTURE DAMAGED AS A RESULT OF WORK PERFORMED. SURFACES AND FINISHED AREAS SHALL BE RESTORED TO MATCH ADJACENT AREAS.
- ALL CONDUCTORS SHALL BE THWN OR THHN COPPER.
- METAL-CLAD (MC) CABLE SHALL NOT BE USED IN ANY PORTION OF THE INSTALLATION UNLESS PRIOR WRITTEN CONSENT IS OBTAINED FROM THE OWNER, ARCHITECT AND ENGINEER.
- ALL OPEN WIRING ABOVE A SUSPENDED CEILING SYSTEM USED AS A RETURN AIR PLENUM SHALL BE RATED FOR USE IN A RETURN AIR PLENUM. ALL CABLING SHALL COMPLY WITH N.F.P.A. STANDARDS.
- ALL EXPOSED CONDUITS SHALL BE RUN AS NEAT AS POSSIBLE. P.V.C. CONDUIT SHALL ONLY BE USED IN SLAB OR UNDERGROUND AT A MINIMUM DEPTH OF 24 INCHES.
- ALL UNDERGROUND CONDUIT INSTALLATIONS SHALL COMPLY WITH NEC SECTION 300.5.
- ALL UNDERGROUND CONDUITS SHALL BE CONVERTED TO E.M.T. CONDUIT ABOVE SLAB LEVEL. ALL UNDERGROUND ELBOWS SHALL BE R.G.S. CONDUIT.
- PROVIDE PULL STRINGS IN ALL EMPTY CONDUITS.
- ALLOW NO MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL) BETWEEN ALL PULL POINTS, E.G., CONDUIT BODIES AND BOXES AS PER NEC 344.26.
- PROVIDE EXPANSION JOINTS WHERE REQUIRED AS PER NEC 300.7(B).
- FLEXIBLE CONDUIT SHALL BE USED FOR CONNECTION TO ALL VIBRATING EQUIPMENT SUCH AS MOTORS, ETC.
- ALL DEDICATED OUTLETS SERVING EQUIPMENT SUCH AS REFRIGERATORS, WATER COOLERS, COPIERS, FAXES, ETC. SHALL HAVE SEPARATE NEUTRAL CONDUCTORS TO EACH DEVICE OR APPLIANCE.
- ALL WIRING DEVICES SHALL BE LEVITON COMMERCIAL GRADE (WHITE DECORA) OR EQUAL AS APPROVED BY ARCHITECT OR ENGINEER.
- ALL RECEPTACLES SHALL BE INSTALLED AT 18" A.F.F. UNLESS OTHERWISE NOTED.
- MAINTAIN FIRE RATING IN ALL PENETRATIONS THRU DEMISING AND FIRE RATED WALLS. THIS INCLUDES MAINTAINING A MINIMUM 24" SEPARATION BETWEEN ELECTRICAL DEVICES MOUNTED ON OPPOSITE SIDES OF ALL FIRE RATED PARTITIONS AND WALLS.
- ELECTRICAL POWER AND CONTROL WIRING FOR H.V.A.C. AND MECHANICAL EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH THE ARCHITECTURAL PLANS BEFORE ROUGH INSTALLATION OF LIGHTS, RECEPTACLES, SWITCHES, AND EQUIPMENT FOR EXACT LOCATION.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT DIMENSIONS AND LOCATIONS OF ALL EQUIPMENT WITH TENANT PRIOR TO ROUGH INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL ELECTRICAL WIRING DEVICES (INCLUDING LUMINAIRES, RECEPTACLES, SWITCHES, CONDUITS, WIRING, ETC.) WITH OTHER TRADES TO AVOID CONFLICTS.
- ELECTRICAL CONTRACTOR SHALL VERIFY THE CEILING FINISHES AND SUSPENSION SYSTEMS FOR SELECTION OF THE PROPER TRIM AND SUPPORT ARRANGEMENTS OF ALL ELECTRICAL DEVICES.
- PROVIDE ACCESS PANELS AS REQUIRED TO SERVICE ALL ELECTRICAL EQUIPMENT ABOVE HARD CEILINGS. COORDINATE WITH ARCHITECT BEFORE ROUGH INSTALLATION.
- WHERE APPLICABLE, ALL LUMINAIRES SHALL BE PROPERLY SECURED TO CEILING GRID SYSTEM.
- LUMINAIRES THAT USE A METAL HALIDE LAMP OTHER THAN A THICK-GLASS PARABOLIC REFLECTOR LAMP (PAR) SHALL BE PROVIDED WITH A CONTAINMENT BARRIER THAT ENCLOSES THE LAMP, OR SHALL BE PROVIDED WITH A PHYSICAL MEANS THAT ONLY ALLOWS THE USE OF A LAMP THAT IS TYPE "O" IN ACCORDANCE WITH NEC 410.130(F)(5).
- FLUORESCENT LUMINAIRES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE OR BALLASTED LUMINAIRES THAT ARE SUPPLIED FROM MULTIWIRE BRANCH CIRCUITS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL HAVE A DISCONNECTING MEANS IN ACCORDANCE WITH NEC 410.130(G), WHERE APPLICABLE.
- ALL LUMINAIRES SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH THE CEILING SYSTEM MANUFACTURER RECOMMENDATIONS AND LOCAL CODE REQUIREMENTS.
- ALL LIGHTING CIRCUITS WHICH CONTROL AND/OR OPERATE LIGHTING FIXTURES WITH AN ELECTRONIC BALLAST SHALL BE PROVIDED WITH A SEPARATE NEUTRAL WIRE PER EACH PHASE.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LIGHT FIXTURE QUANTITIES AND MEASUREMENTS (LENGTHS) ON PLANS PRIOR TO SUBMITTAL OF SHOP DRAWINGS.
- EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS WHAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES AS PER NEC 210.4(B).
- ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE APPROVED AS SAFE FOR USE IN THE U.S. WORKPLACE FOR THE INTENDED APPLICATION, AS DETERMINED BY AN ORGANIZATION CURRENTLY RECOGNIZED BY OSHA (OCCUPATIONAL SAFETY AND HEALTH) AS A NRTL (NATIONALLY RECOGNIZED TEST LABORATORY). (E.G. - UL, CSA, ETC.)
- AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.3.1, FEEDER AND CUSTOMER-OWNED SERVICE CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2 PERCENT AT DESIGN LOAD REGARDLESS OF SIZES SHOWN ON PLANS OR PANEL SCHEDULES.
- ALL BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH N.E.C. 210.19 AND FOR A MAXIMUM VOLTAGE DROP OF 3 PERCENT AT DESIGN LOAD AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.3.2 REGARDLESS OF SIZES SHOWN ON PLANS OR PANEL SCHEDULES.
- AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.4.1, WITHIN 30 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED BY THE GENERAL CONTRACTOR TO THE BUILDING OWNER, INCLUDING:
  1. A SINGLE-LINE DIAGRAM OF THE BUILDING ELECTRICAL DISTRIBUTION SYSTEM AND
  2. FLOOR PLANS INDICATING LOCATION AND AREA SERVED FOR ALL DISTRIBUTION.
- AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.4.2, THE GENERAL CONTRACTOR SHALL PROVIDE AN OPERATING MANUAL AND MAINTENANCE MANUAL TO THE BUILDING OWNER. THE MANUALS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
  1. SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
  2. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
  3. NAMES AND ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE AGENCY.
- IF ANY CONFLICT IS ENCOUNTERED WITHIN THE DESIGN DOCUMENTS, REGARDLESS OF TRADE OR RESPONSIBILITY, THE GREATER SCOPE OF WORK SHALL PREVAIL.
- CONTRACTOR SHALL WARRANT ALL WORK TO BE FREE OF DEFECT IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF THE PROJECT.

REVISIONS	NUM.

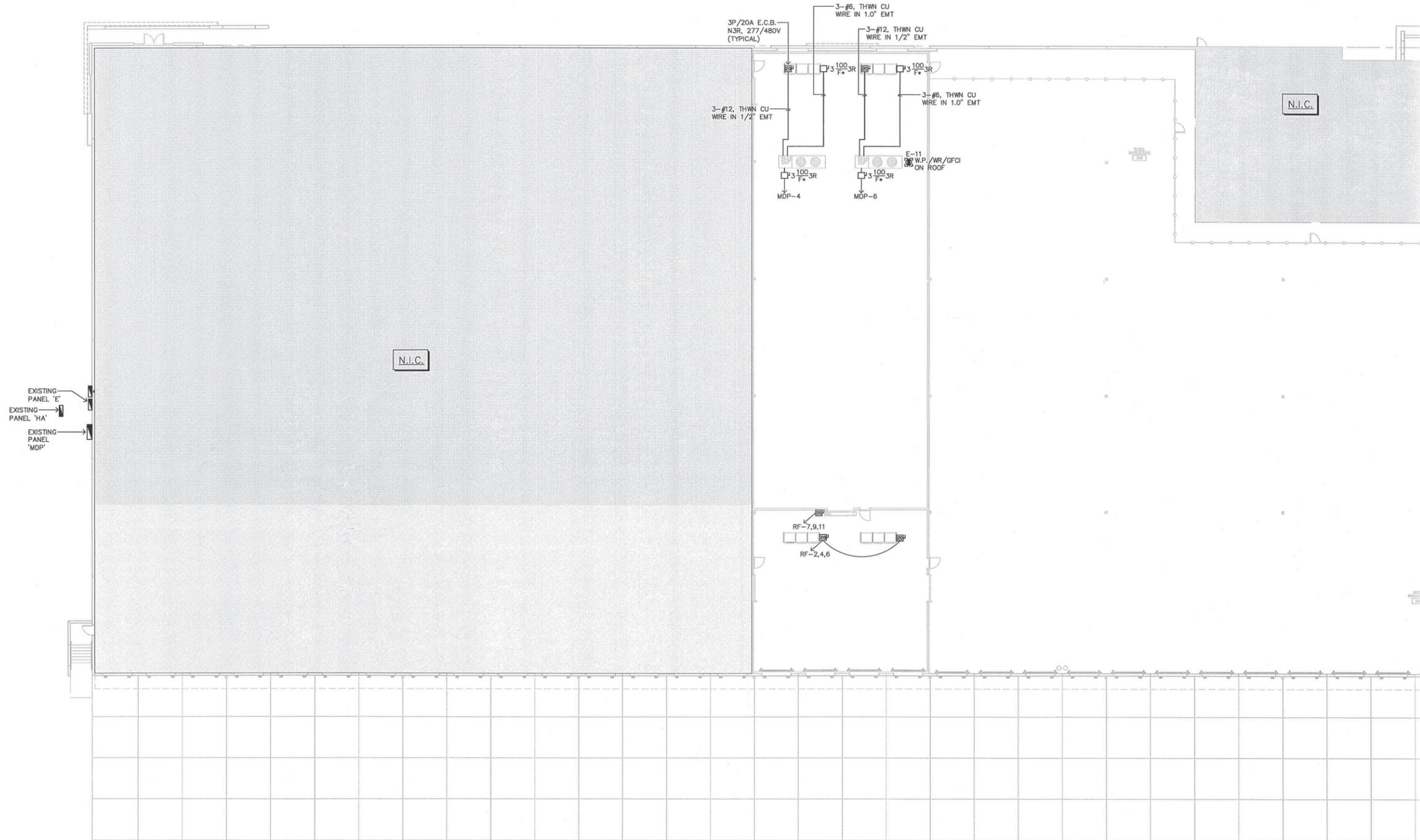
Puga and Associates, Inc.  
 Engineering/Consultants  
 7389 S.W. 45th Street  
 Suite B  
 Miami, Florida 33165  
 (305) 661-7700

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 REFRIGERATION FACILITY  
 MIAMI, FLORIDA

DRAWN  
 CHECKED  
 DATE  
 SCALE  
 JOB NO.  
 SHEET  
**E-100**  
 1 OF 4 SHEETS





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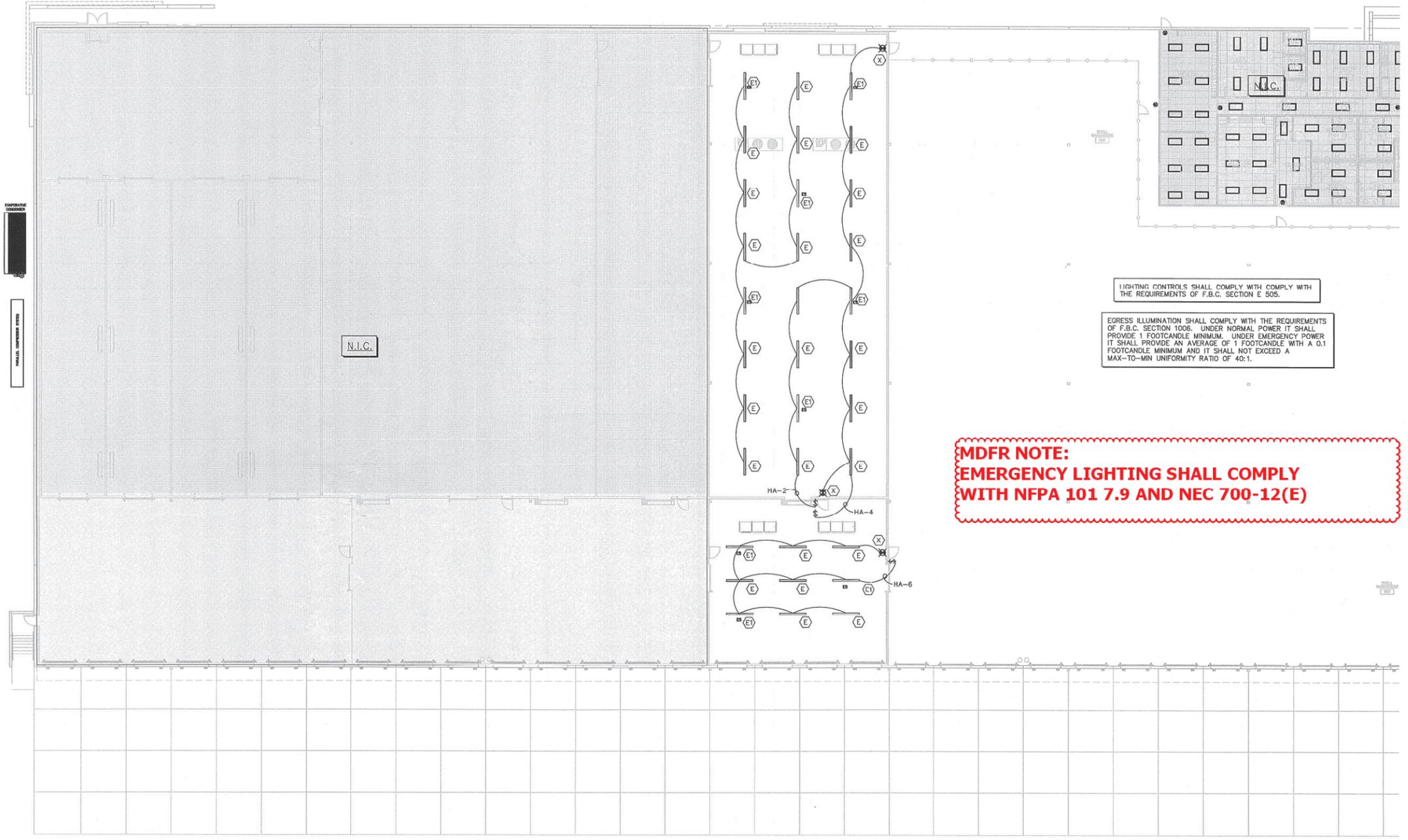
Puga and Associates, Inc.  
 Engineers/Consultants  
 7239 S.W. 14th Street  
 Miami, Florida 33155  
 (305) 681-7700

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 REFRIGERATION FACILITY  
 MIAMI, FLORIDA

DRAWN
CHECKED
DATE
SCALE
JOB NO.
SHEET
<b>E-200</b>
2 OF 4 SHEETS





LIGHTING CONTROLS SHALL COMPLY WITH THE REQUIREMENTS OF F.B.C. SECTION E 505.

EGRESS ILLUMINATION SHALL COMPLY WITH THE REQUIREMENTS OF F.B.C. SECTION 1006. UNDER NORMAL POWER IT SHALL PROVIDE 1 FOOTCANDLE MINIMUM. UNDER EMERGENCY POWER IT SHALL PROVIDE AN AVERAGE OF 1 FOOTCANDLE WITH A 0.1 FOOTCANDLE MINIMUM AND IT SHALL NOT EXCEED A MAX-TO-MIN UNIFORMITY RATIO OF 40:1.

**MDRF NOTE:**  
**EMERGENCY LIGHTING SHALL COMPLY WITH NFPA 101 7.9 AND NEC 700-12(E)**

REVISIONS	NUM.

Puga and Associates, Inc.  
 Engineers/Consultants  
 7836 S.W. 48th Street  
 Suite B  
 Miami, Florida 33155  
 (305) 861-7700

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 REFRIGERATION FACILITY  
 MIAMI, FLORIDA



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Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
Victor Lombardi	12/23/2013 1:42:01 PM	A	ELEC	Approved
Ron Bennett	12/23/2013 7:42:42 AM	P	FIRE	Approved As Noted

1 ELECTRICAL LIGHTING PLAN  
 E-300 SCALE: 1/16"=1'-0"

PANEL E (EXISTING)									
TYPE : SQD-NQOD		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE	
LOC : REFRIGERATION EQUIPMENT ROOM		FEEDER : EXISTING		MAINS : M.L.O.		BUS : 225A		VOLTS : 277/480, 3PHS, 4W	
A.I.C. : 10,000									
CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C
(A)- 1	1/20	0.50	CONDENSATE PUMP	EXISTING	2	1/20	1.00	RECEPTACLES	EXISTING
(A)- 3	1/20	1.00	COMPRESSOR CONT.	EXISTING	4	1/20	1.00	RECEPTACLES	EXISTING
5					6	1/20	1.00	RECEPTACLES	EXISTING
(A)- 7	1/20	0.70	EF-4	EXISTING	8	1/20	1.00	RECEPTACLES	EXISTING
(A)- 9	1/20	1.50	EF-3	EXISTING	10	1/20	1.00	RECEPTACLES	EXISTING
(C)- 11	1/20	0.50	ROOFTOP GFI	3-#12, 1/2"	12	1/20	1.00	RECEPTACLES	EXISTING
13			SPACE		14	1/20	1.00	RECEPTACLES	EXISTING
15			SPACE		16	1/20	1.00	RECEPTACLES	EXISTING
17			SPACE		18	1/20	1.00	RECEPTACLES	EXISTING
19			SPACE		20	1/20	1.00	RECEPTACLES	EXISTING
21			SPACE		22	1/20	1.00	RECEPTACLES	EXISTING
23			SPACE		24	1/20	1.00	RECEPTACLES	EXISTING
25			SPACE		26	1/20	1.00	RECEPTACLES	EXISTING
27			SPACE		28	1/20	0.50	RECEPTACLES	EXISTING
29			SPACE		30	1/20	0.80	GEN. LIGHT	EXISTING
31			SPACE		32	1/20	0.50	RECEPTACLES	EXISTING
33			SPACE		34			SPACE	
35			SPACE		36			SPACE	
37			SPACE		38			SPACE	
39			SPACE		40			SPACE	
41			SPACE		42			SPACE	
TOTAL 4.20 KVA					TOTAL 14.80 KVA				

19.00 KVA - TOTAL CONNECTED LOAD

19.00 KVA / 208 X  $\sqrt{3}$  = 22.87 AMPS

- (A)-EXISTING CKT TO REMAIN.
- (B)-EXISTING CKT & BREAKER TO BE RE-USED. PROVIDE NEW BRANCH CONDUIT & WIRE.
- (C)-NEW CIRCUIT FROM EXISTING PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE.
- (D)-REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. INSTALL BLANK COVER(S) IN PANEL AND MARK AS SPACE.
- (E)-REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..
- (F)-EXISTING CIRCUIT FROM ORIGINAL PANEL TO BE RE-FED FROM NEW PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

PANEL HA (EXISTING)									
TYPE : SQD-NQOD		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE	
LOC : REFRIGERATION EQUIPMENT ROOM		FEEDER : EXISTING		MAINS : M.L.O.		BUS : 225A		VOLTS : 277/480, 3PHS, 4W	
A.I.C. : 35,000									
CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C
1					2	1/20	2.80	COOLER LIGHTS	3-#12, 1/2"
(A)- 3	3/20	9.10	RECOVERY UNIT	EXISTING	4	1/20	2.80	COOLER LIGHTS	3-#12, 1/2"
5					6	1/20	2.10	COOLER LIGHTS	3-#12, 1/2"
7					8			SPACE	
(A)- 9	3/20	9.10	RECOVERY UNIT	EXISTING	10			SPACE	
11					12			SPACE	
13					14			SPACE	
(A)- 15	3/20	9.10	RECOVERY UNIT	EXISTING	16			SPACE	
17					18			SPACE	
19					20			SPACE	
(A)- 21	3/20	9.10	RECOVERY UNIT	EXISTING	22			SPACE	
23					24			SPACE	
25					26			SPACE	
(A)- 27	3/30	20.00	HEATER FUMIG EQUIP.	EXISTING	28			SPACE	
29					30			SPACE	
31			SPACE		32	1/20	1.30	GEN. LIGHT	EXISTING
33			SPACE		34	1/20	1.30	GEN. LIGHT	EXISTING
35			SPACE		36	1/20	1.30	GEN. LIGHT	EXISTING
37			SPACE		38	1/20	1.30	GEN. LIGHT	EXISTING
39			SPACE		40	1/20	1.90	GEN. LIGHT	EXISTING
41			SPACE		42	1/20	1.90	GEN. LIGHT	EXISTING
TOTAL 56.40 KVA					TOTAL 16.70 KVA				

73.10 KVA - TOTAL CONNECTED LOAD

73.10 KVA / 480 X  $\sqrt{3}$  = 88.0 AMPS

- (A)-EXISTING CKT TO REMAIN.
- (B)-EXISTING CKT & BREAKER TO BE RE-USED. PROVIDE NEW BRANCH CONDUIT & WIRE.
- (C)-NEW CIRCUIT FROM EXISTING PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE.
- (D)-REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. INSTALL BLANK COVER(S) IN PANEL AND MARK AS SPACE.
- (E)-REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..
- (F)-EXISTING CIRCUIT FROM ORIGINAL PANEL TO BE RE-FED FROM NEW PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

PANEL RF									
TYPE : SQD-NF		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE	
LOC : REFRIGERATION EQUIPMENT ROOM		FEEDER : 4-#6, 1.0"		MAINS : M.L.O.		BUS : 125A		VOLTS : 277/480, 3PHS, 4W	
A.I.C. : 35,000									
CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C
1			SPACE		2			SPACE	
3			SPACE		4	3/20	12.96	EVAP SC 3	3-#10, 3/4"
5	1/20	1.00	SPARE		6				
7					8	1/20	1.00	SPARE	
9	3/20	5.65	NERGECO DOORS	3-#10, 3/4"	10	1/20	1.00	SPARE	
11					12			SPACE	
13			SPACE		14			SPACE	
15			SPACE		16			SPACE	
17			SPACE		18			SPACE	
19			SPACE		20			SPACE	
21			SPACE		22			SPACE	
23			SPACE		24			SPACE	
25			SPACE		26			SPACE	
27			SPACE		28			SPACE	
29			SPACE		30			SPACE	
TOTAL 6.65 KVA					TOTAL 14.96 KVA				

21.61 KVA - TOTAL CONNECTED LOAD  
0.00 KVA - 25% OF CONTINUOUS LOAD  
21.61 KVA - TOTAL DEMAND LOAD

21.61 KVA / 480 X  $\sqrt{3}$  = 26.0 AMPS

- (LC1)-CONNECT THRU LIGHTING SWITCHING PANEL. PROVIDE 8-CIRCUIT SWITCHING PANEL THAT PROVIDES A 7-DAY ASTRONOMICAL ELECTRONIC TIME SWITCH WITH 10-YEAR POWER FAILURE MEMORY. USE "LUTRON" SOFTSWTCH128 #XPSB-#A0B-F7; #-ORDER WITH 2-POLE 480V CONTACTORS AS NEEDED, ONE FOR EACH 2-POLE BREAKER. OPERATING INSTRUCTIONS OF SYSTEM SHALL BE PROVIDED TO OWNER.
- (-)-PROVIDE LOCK-ON BREAKER

PANEL MDP (EXISTING)									
TYPE : SQD - I-LINE		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE		MNT : SURFACE	
LOC : REFRIGERATION EQUIPMENT ROOM		FEEDER : EXISTING		MAINS : M.L.O.		BUS : 800 AMP		VOLTS : 277/480, 3PHS, 4W	
A.I.C. : 65,000									
CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C
(A)- 1	3/200	74.00	PANEL 'HA'	EXISTING	2	3/200	142.90	PANEL 'HC'	EXISTING
(A)- 3	3/200	122.10	PANEL 'HE'	EXISTING	4	3/100	52.52	SYSTEM 7-1	3-#4, 1.25"
5			SPACE		6	3/100	54.76	SYSTEM 7-2	3-#4, 1.25"
(C)- 8	3/60	26.21	PANEL 'RF'	4-#1, 1.0"	8			SPACE	
TOTAL 222.31 KVA					TOTAL 252.42 KVA				

474.73 KVA - TOTAL CONNECTED LOAD

474.73 KVA / 480 X  $\sqrt{3}$  = 571.3 AMPS

- (A)-EXISTING CKT TO REMAIN.
- (B)-EXISTING CKT & BREAKER TO BE RE-USED. PROVIDE NEW BRANCH CONDUIT & WIRE.
- (C)-NEW CIRCUIT FROM EXISTING PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE.
- (D)-REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. INSTALL BLANK COVER(S) IN PANEL AND MARK AS SPACE.
- (E)-REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..
- (F)-EXISTING CIRCUIT FROM ORIGINAL PANEL TO BE RE-FED FROM NEW PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

REVISIONS	NUM.

Puga and Associates, Inc.  
Engineers/Consultants  
7389 S.W. 45th Street  
Suite B  
Miami, Florida 33155  
(305) 661-7700



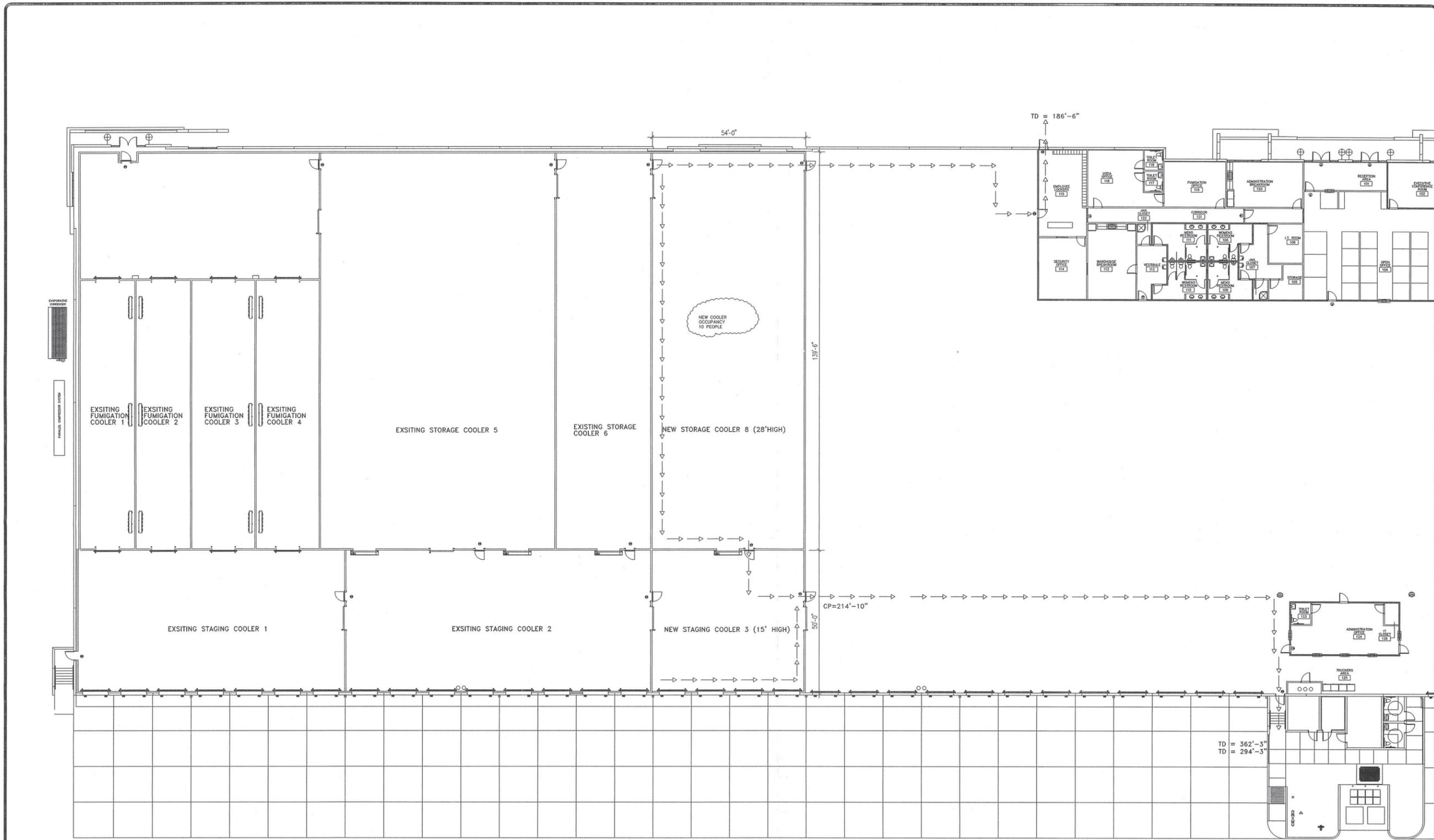
REFRIGERATION ENGINEERED  
SYSTEMS, INC.  
7215 NW 36 AVE.  
MIAMI, FL 33147  
TEL: (305) 836-6900

SLFC - BUILDING 1  
REFRIGERATION FACILITY  
MIAMI, FLORIDA



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DATE
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JOB NO.
SHEET

E-400



EXISTING COOLER PERMIT NO. 2013065568  
 EXISTING OFFICE PERMIT NO. 2013011216

Miami Dade County Department of Regulatory And Economic Resources - Job Copy  
 0000865374 - 1/17/2014 1:32:57 PM  
 LS-1-01082014.PDF  
 Examiner Date Time Stamp Disp. Trade Stamp Name  
 Mario Soto 1/10/2014 2:02:36 PM A BLDG Approved

LIFE SAFETY SCALE 1/16" : 1'



REVISIONS	NUM.

**mep**  
 consulting engineer  
 analysis - planning - permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275 4376 F: (786) 332 3917  
 mep-miami.com  
 ENGINEER OF RECORD.  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

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SCALE
JOB NO.
SHEET
LS-1
OF SHEETS

1/6/14

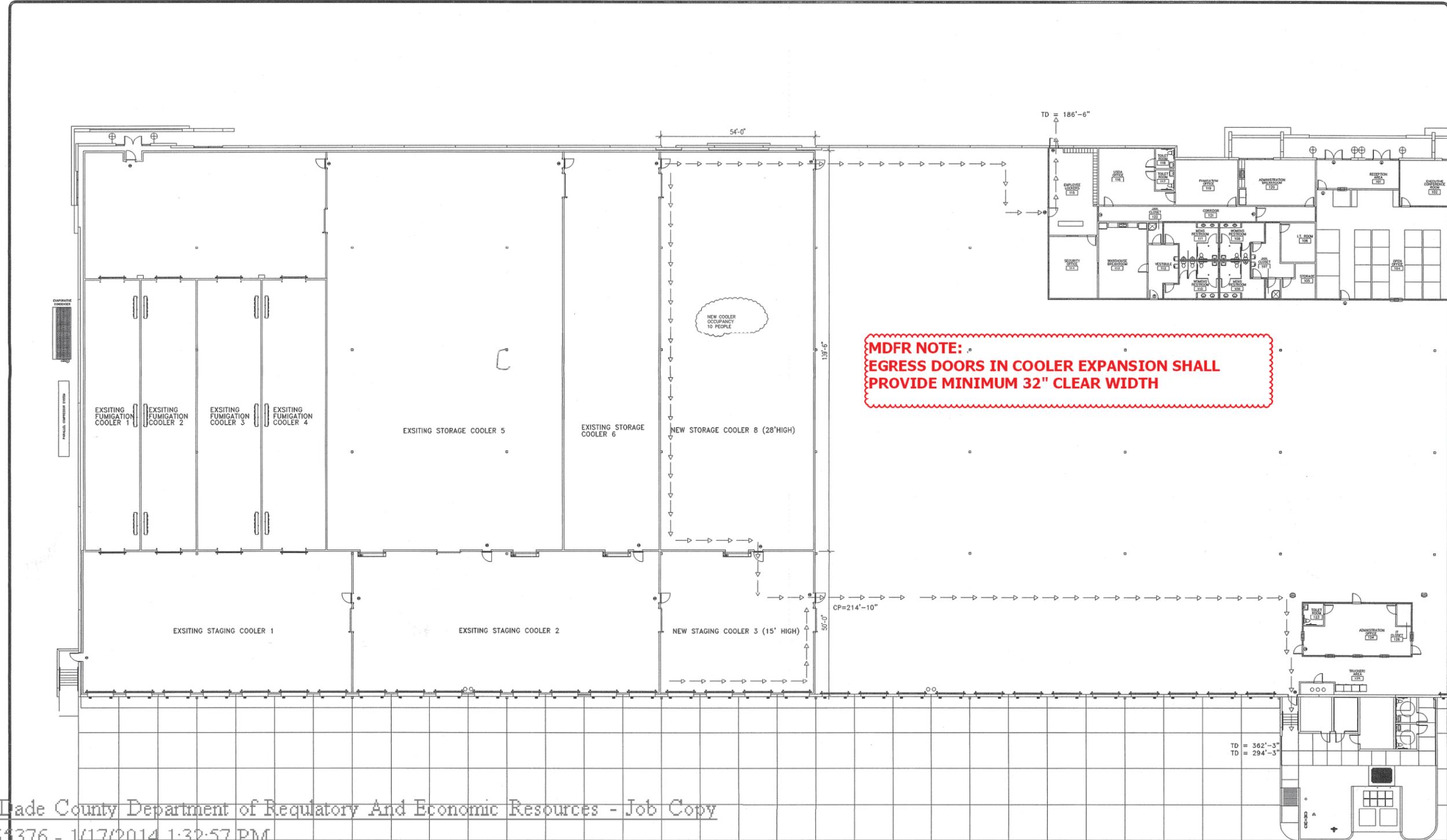
REVISIONS	NUM.

**mep**  
 consulting engineer  
 design • planning • permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275-4376 F: (786) 332-9917  
 mep-miami.com  
 ENGINEER OF RECORD  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

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OF SHEETS



Miami Dade County Department of Regulatory And Economic Resources - Job Copy

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LS-1-12192013.PDF

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Ron Bennett	12/23/2013 7:41:08 AM	A	FIRE	Approved
JoAnn Pirrello	12/23/2013 12:58:30 PM	A	ZONE	Approved
Mario Soto	1/10/2014 2:00:26 PM	V	BLDG	Void
Mario Soto	12/26/2013 11:45:49 AM	R	BLDG	Reference only

LIFE SAFETY SCALE 1/16" : 1'

REVISIONS	NUM.

**mep**  
 consulting engineer  
 analyze - planning - permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275-4376 F: (786) 332-3917  
 mep-miami.com

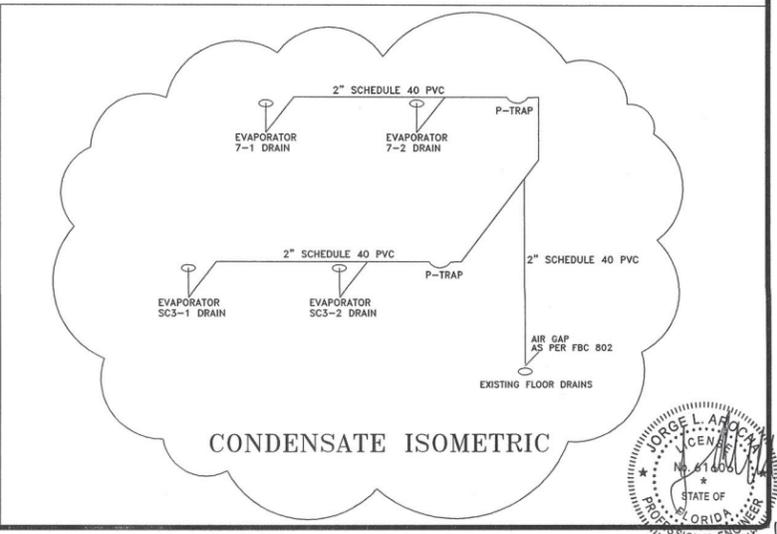
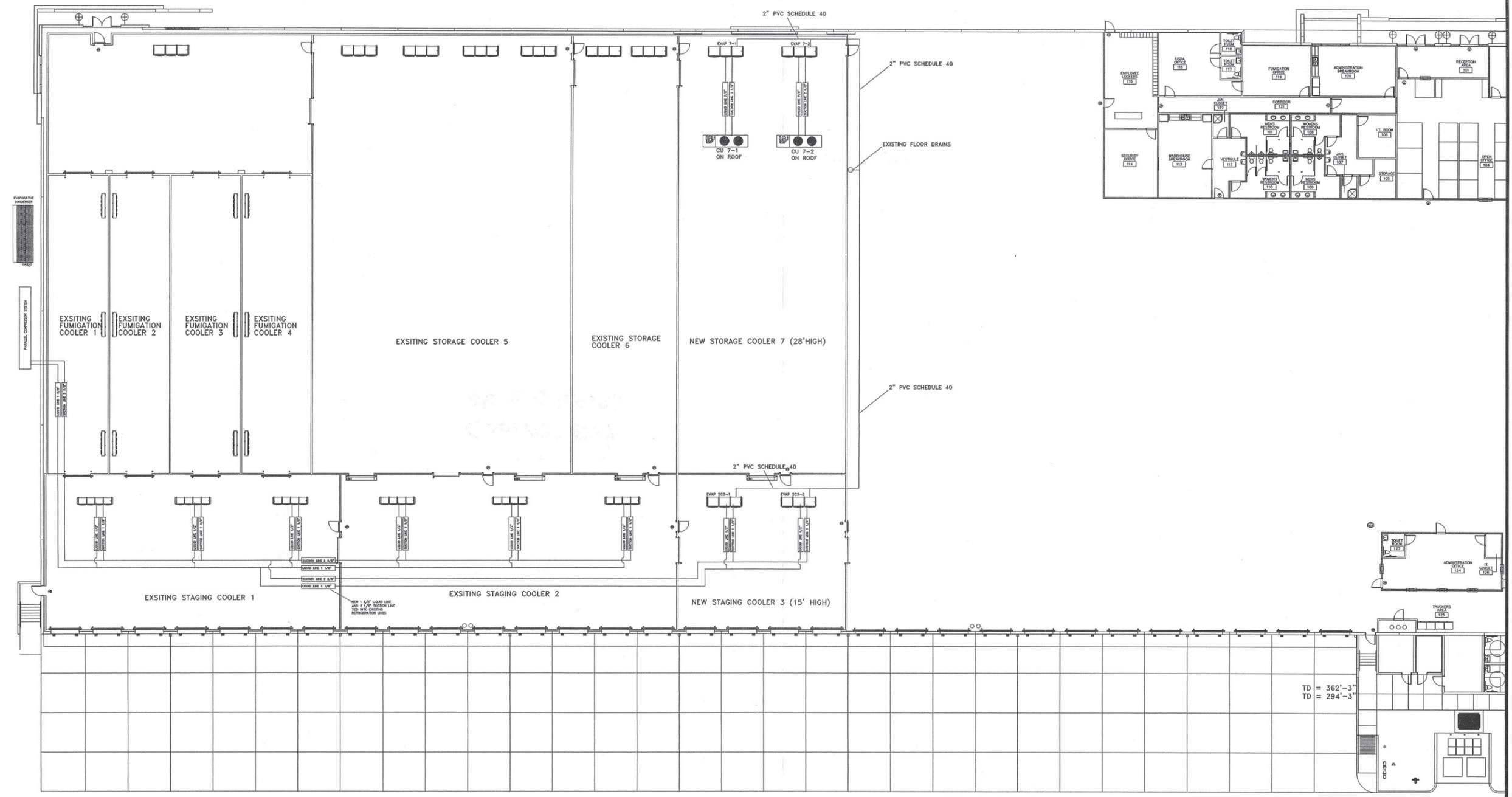
ENGINEER OF RECORD.  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

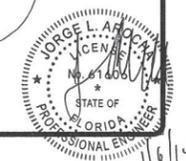
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JOB NO.
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TD = 186'-6"

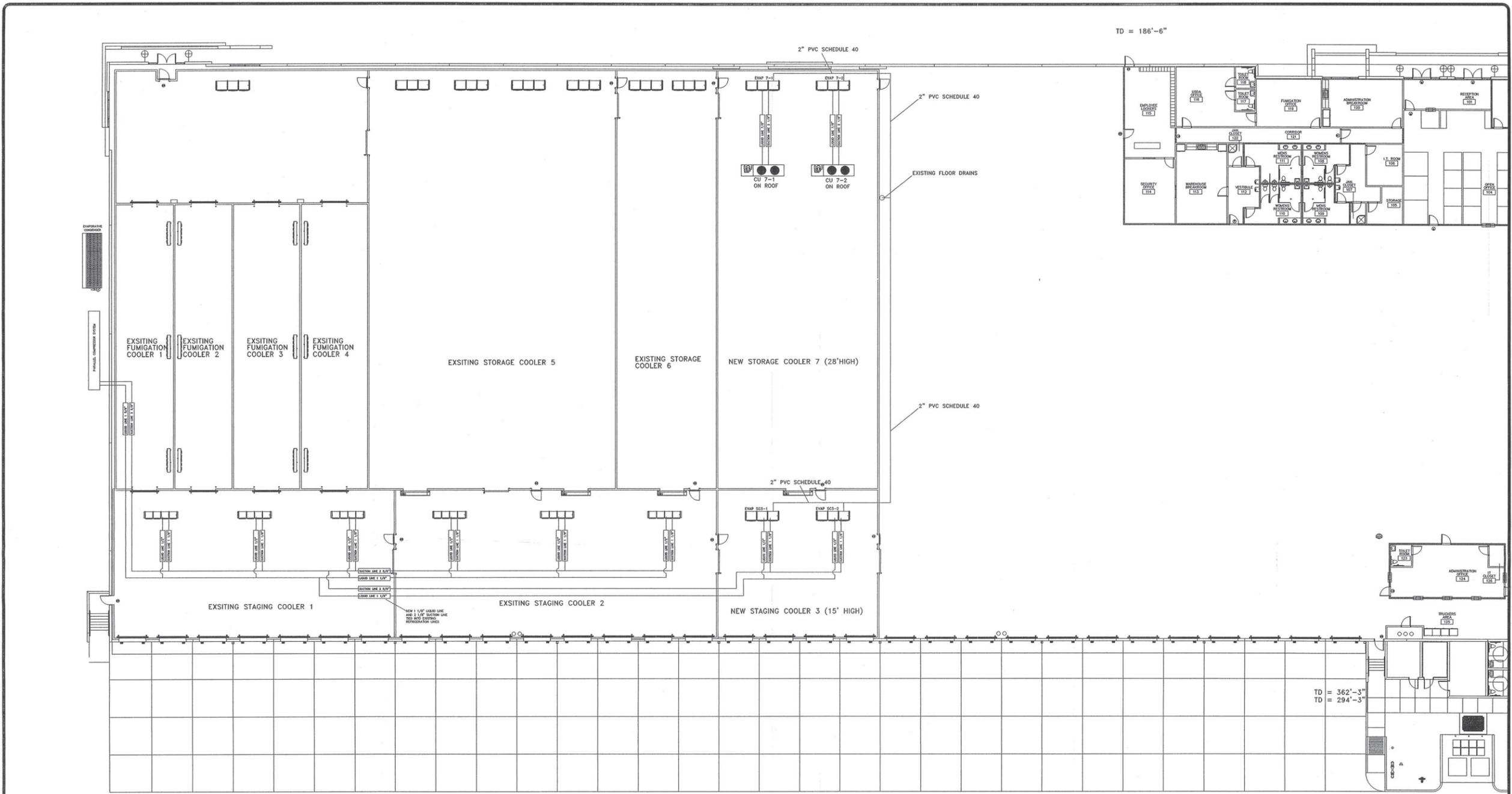


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 Examiner Date Time Stamp Disp. Trade Stamp Name  
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REFRIGERATION PIPING AND CONDENSATE DRAINS SCALE 1/8": 1'

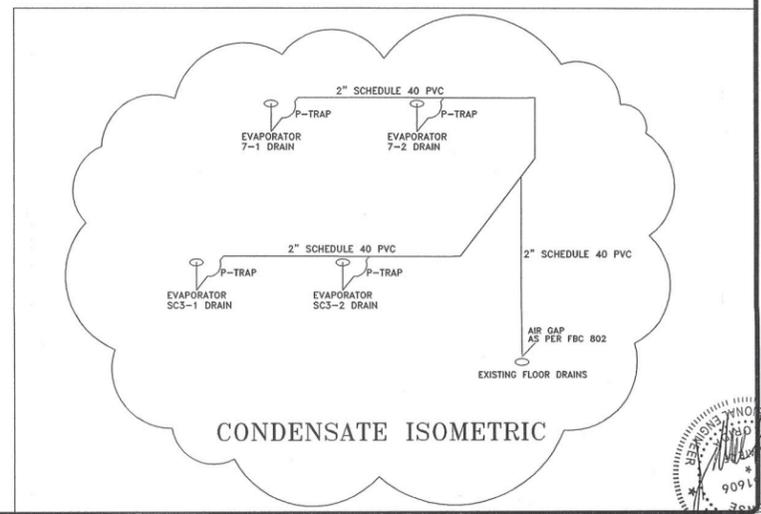


1614



TD = 186'-6"

TD = 362'-3"  
TD = 294'-3"



REVISIONS	NUM.

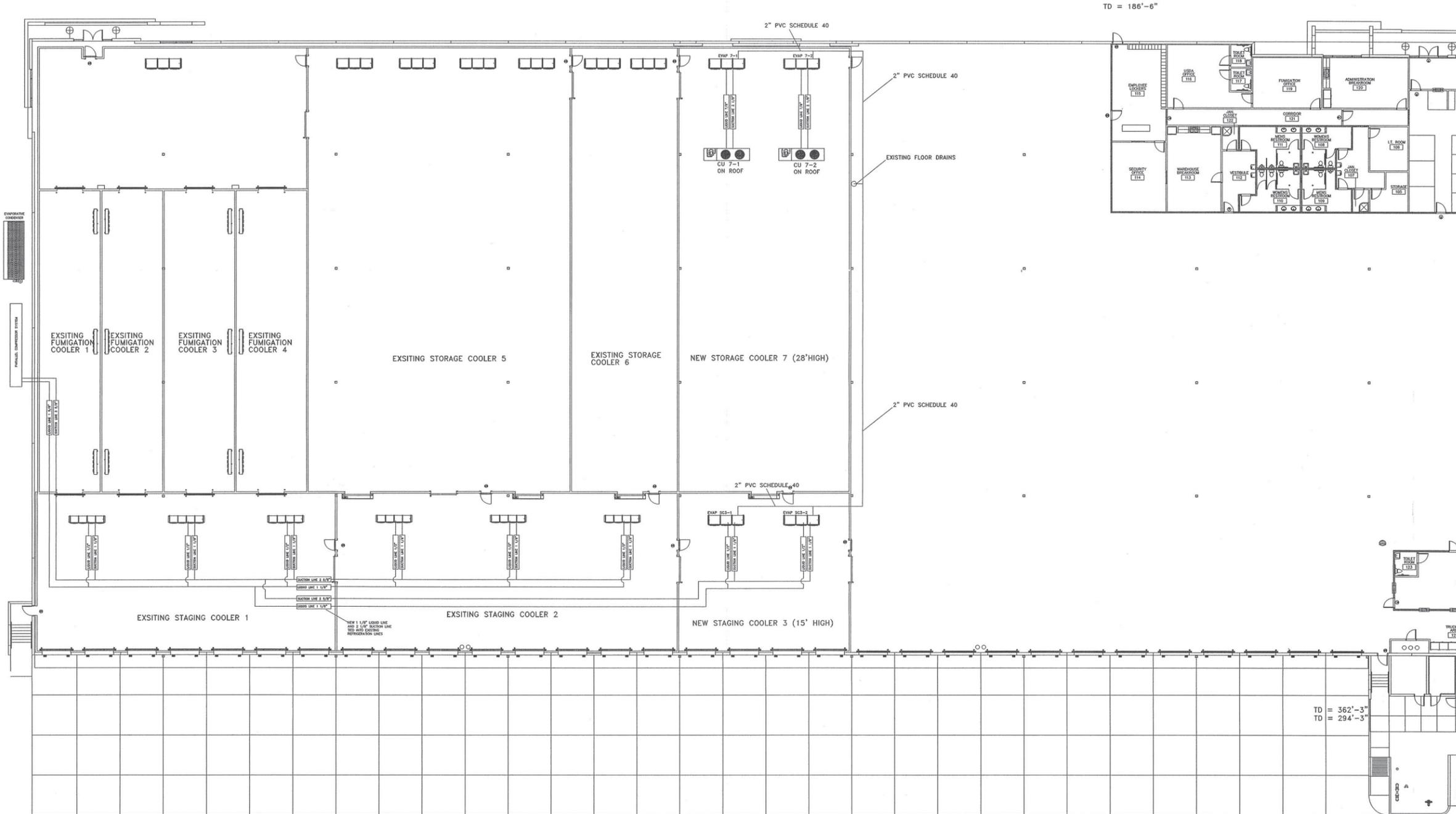
**mep**  
consulting engineer  
analyze - planning - permit  
2300 NW 94th Ave Doral, FL 33172  
T: (786) 275 4378 F: (786) 332 3917  
mep-miami.com  
ENGINEER OF RECORD  
JORGE AROCHA  
P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
SYSTEMS, INC.  
7215 NW 36 AVE.  
MIAMI, FL 33147  
TEL: (305) 836-6900

SLFC - BUILDING 1  
3200 NW 67TH AVENUE  
MIAMI, FLORIDA 33166

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REVISIONS	NUM.

**mep**  
 consulting engineer  
 estimate - planning - permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275-4378 F: (786) 332-9917  
 mep-miami.com  
 ENGINEER OF RECORD:  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

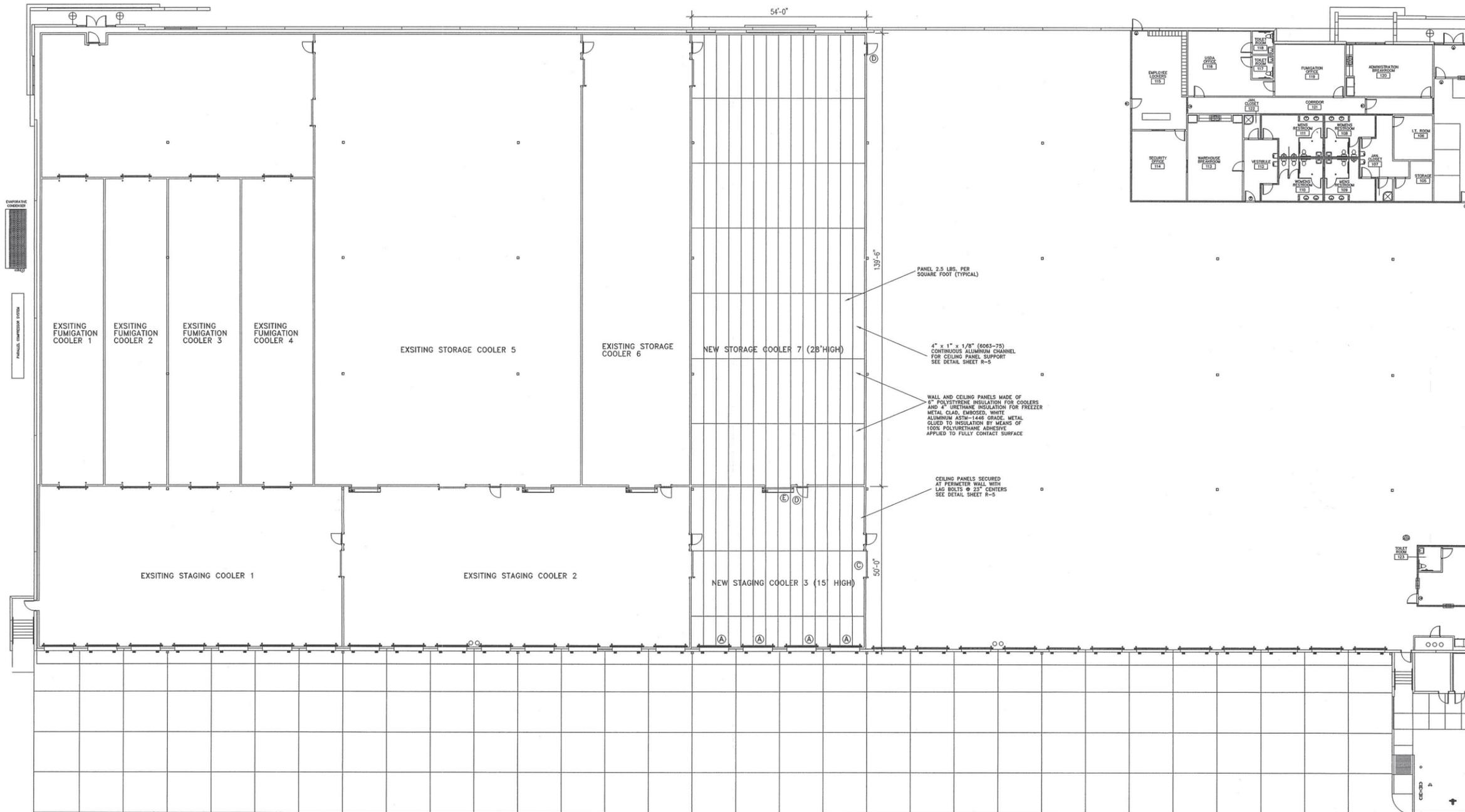
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Miami Dade County Department of Regulatory And Economic Resources - Job Copy

Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
David Ferreira	12/20/2013 5:33:11 PM	A	MECH	Approved
Wilfredo Urquiaga	1/9/2014 10:08:31 AM	V	PLUM	Void

REFRIGERATION PIPING AND CONDENSATE DRAINS SCALE 1/8": 1'





REVISIONS	NUM.

**mep**  
 consulting engineer  
 analyze - planning - permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275-4376 F: (786) 332-3917  
 mep@miami.com

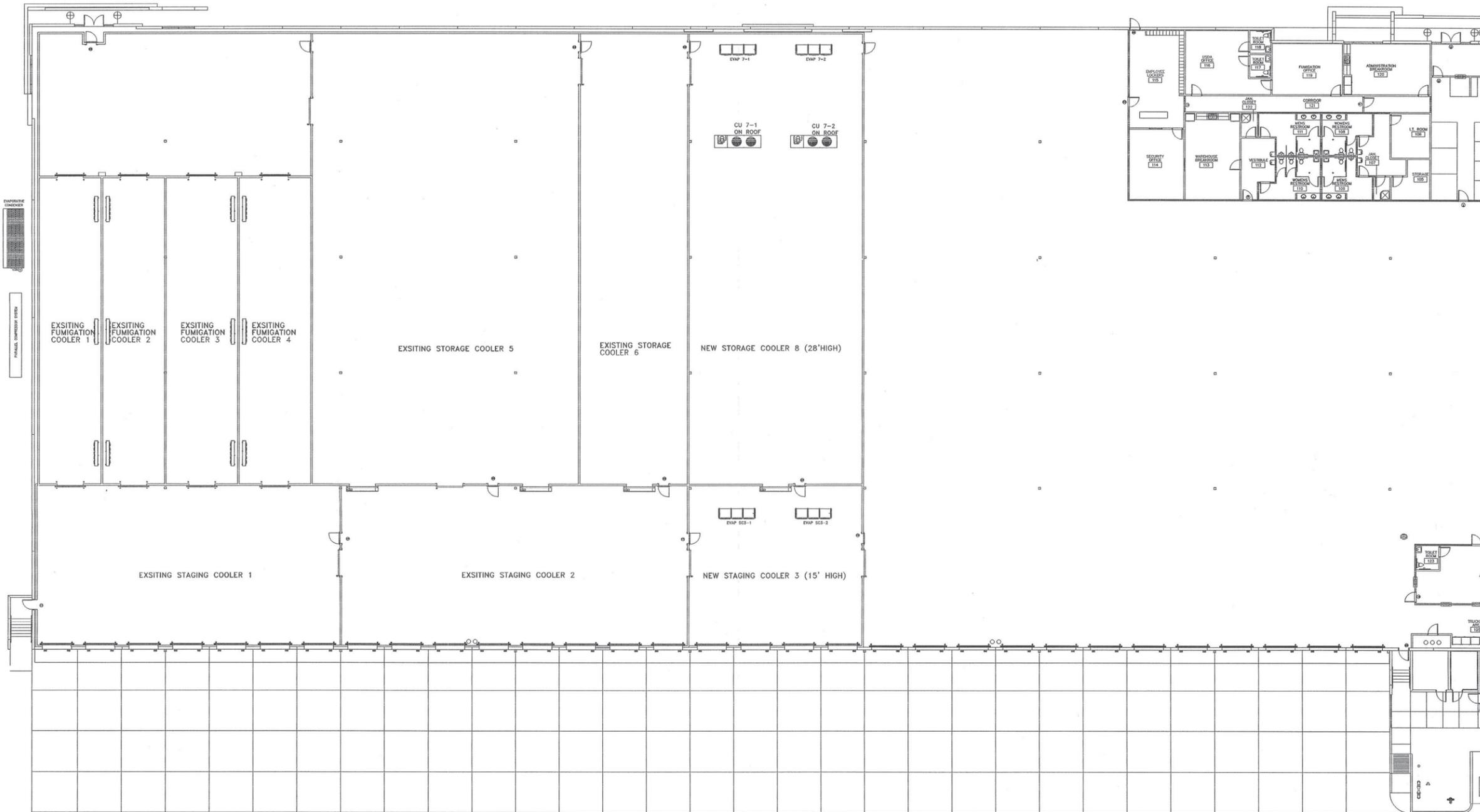
ENGINEER OF RECORD.  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

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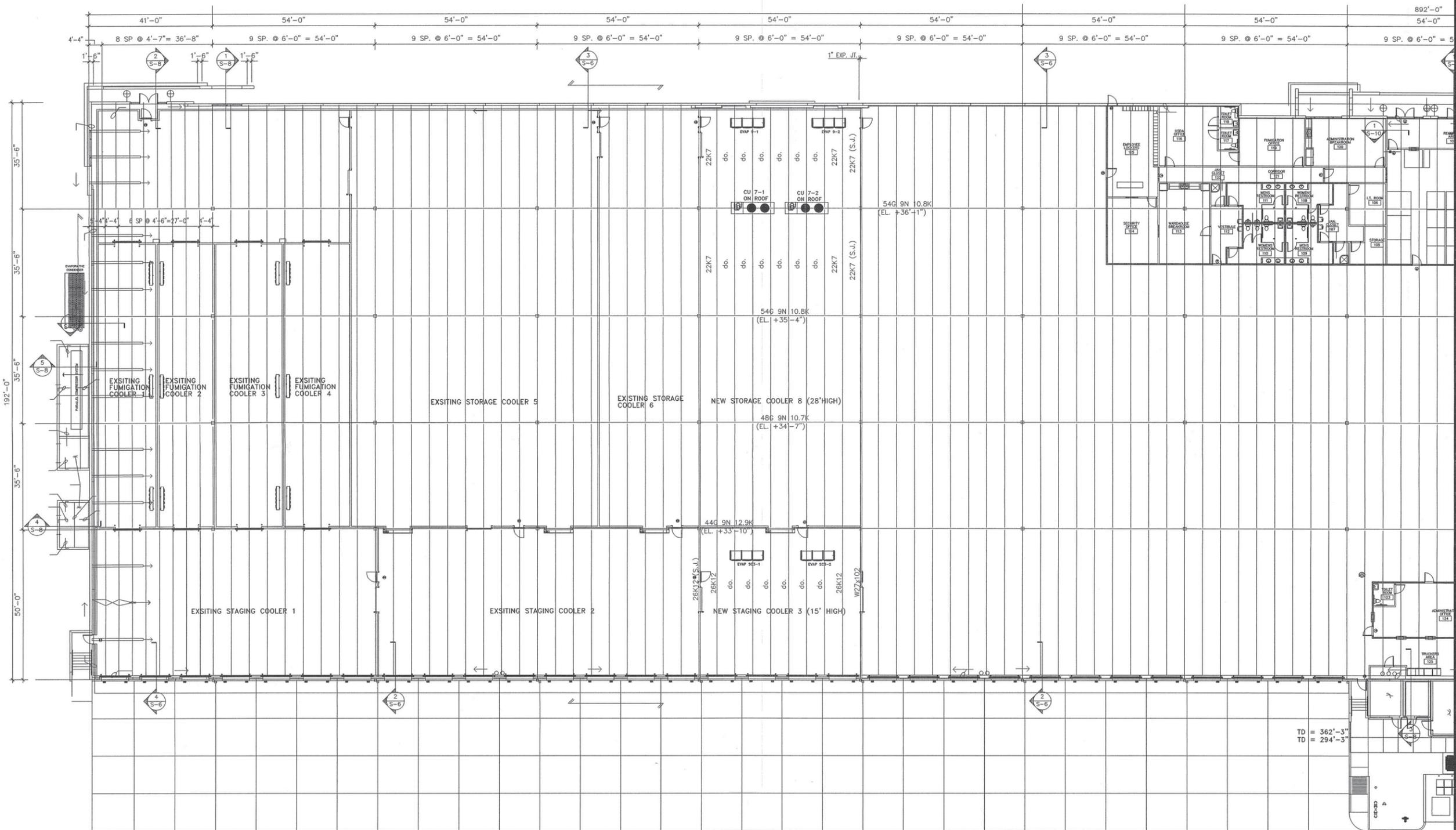
**mep**  
 consulting engineer  
 analyze - planing - permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275-4376 F: (786) 332-2917  
 mep-miami.com  
 ENGINEER OF RECORD:  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

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JOB NO.
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OF SHEETS





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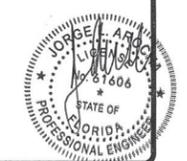
**mcp**  
 consulting engineer  
 analysis - planning - permit  
 2300 NW 94th Ave Doral, FL 33172  
 T: (786) 275-4376 F: (786) 332-3917  
 mcp@miami.com

ENGINEER OF RECORD:  
 JORGE AROCHA  
 P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED  
 SYSTEMS, INC.  
 7215 NW 36 AVE.  
 MIAMI, FL 33147  
 TEL: (305) 836-6900

SLFC - BUILDING 1  
 3200 NW 67TH AVENUE  
 MIAMI, FLORIDA 33166

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1/6/14



## APPENDIX D

# Benchmark Analysis

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# BENCHMARKED FACILITIES

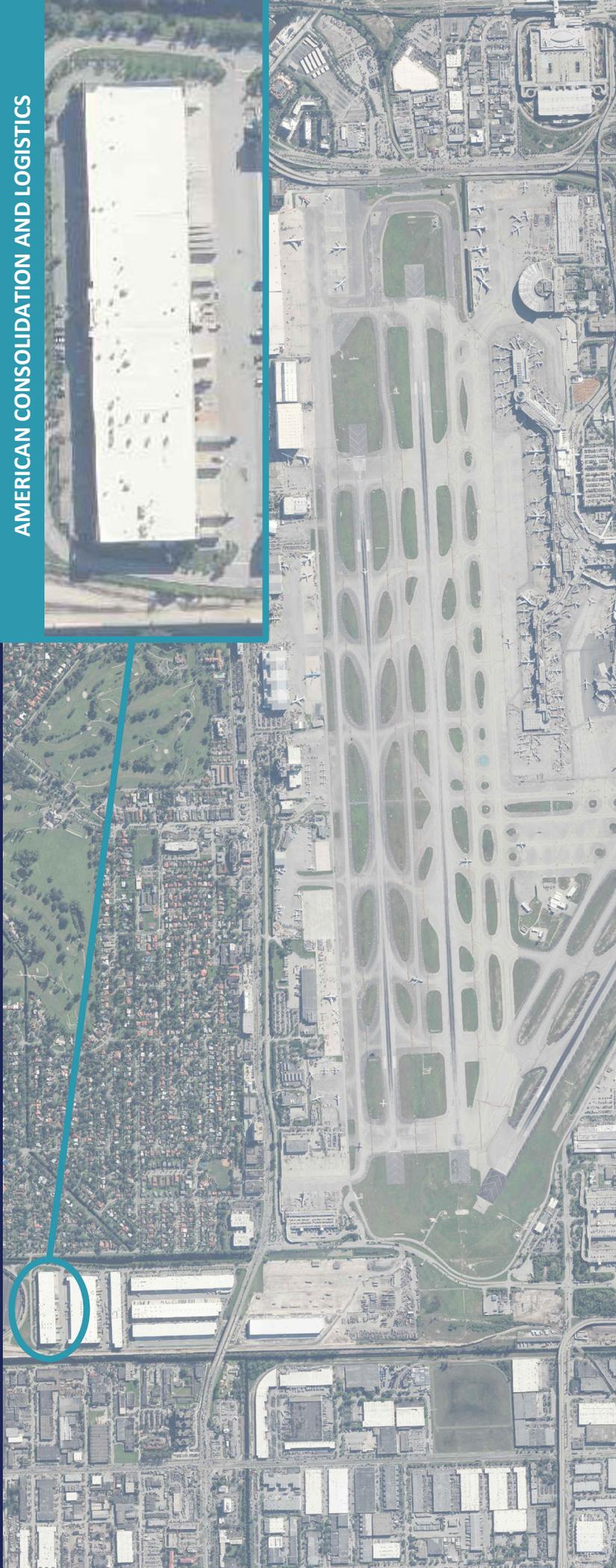


# Benchmarking Candidates

Airport	Fumigation Operator	Year Built	Facility Size (sq. ft.)
Gulfport-Biloxi International Airport (Mississippi)	Gateway America	2010	46,000
<b>Off-Airport</b>			
Miami	American Consolidation and Logistics (ACL)	2013	170,000
Port of Baltimore	Wallenius Wilhelmsen Solutions	2015	26,000

# Miami (Off-Airport)

Operator: American Consolidation and Logistics (ACL)



AMERICAN CONSOLIDATION AND LOGISTICS

Source: Quantum Spatial, 2017 MIA Aerial Image, October 2017.

# Miami (Off-Airport)

Operator: American Consolidation and Logistics (ACL)

- Facility Characteristics:
  - Building Size: 170,000 sq. ft.,
  - 4 fumigation chambers (360 pallets total), with a 95% emission free, recover system for the methyl bromide,
  - 31 bays under refrigeration,
  - 12 advanced forced air units (capacity for 120 pallets at a time),
  - Storage capacity of 3,500 pallets,
  - Controlled environment,
  - 1.4 miles from MIA cargo warehouses.

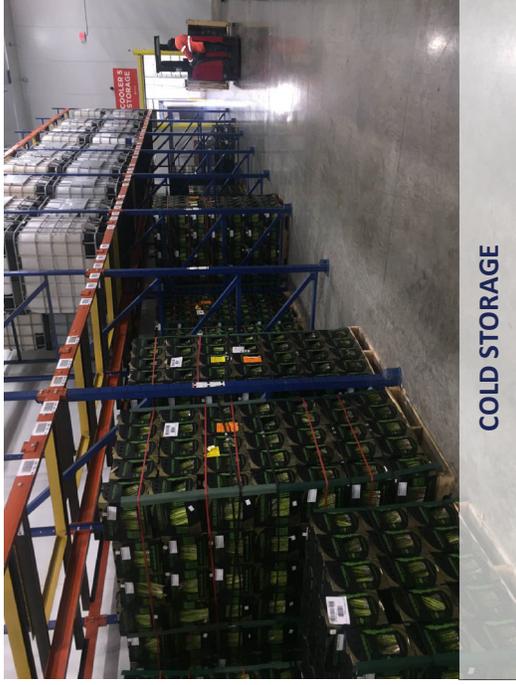
Source: ACL, <http://www.amerconsolidated.com/airport.html>, July 2018.

# Miami (Off- Airport)

Operator: American Consolidation and Logistics (ACL)



LOADING DOCKS ENTRANCE



COLD STORAGE



FUMIGATION CHAMBERS

Source: ACL, <http://www.amerconsolidated.com/airport.html>, July 2018.

# Port of Baltimore (Off-Airport)

Operator: Wallenius Wilhelmsen Solutions

WALLENIUS WILHELMSSEN SOLUTIONS



Source: Google Earth Pro, 2018;



Fumigation Facilities Relocation | September, 2018

DRAFT

# Port of Baltimore (Off-Airport)

Operator: Wallenius Wilhelmsen Solutions

- Facility Characteristics:
  - Building Size: 26,000 sq. ft.,
  - 148,000 cubic meters of cargo fumigated in 2017,
  - 1 fumigation chamber,
  - State-of-the-art ventilation system,
  - Cargo fumigated for up to 12 hours,
  - followed by up to 20 hours of ventilation,
  - Controlled environment.

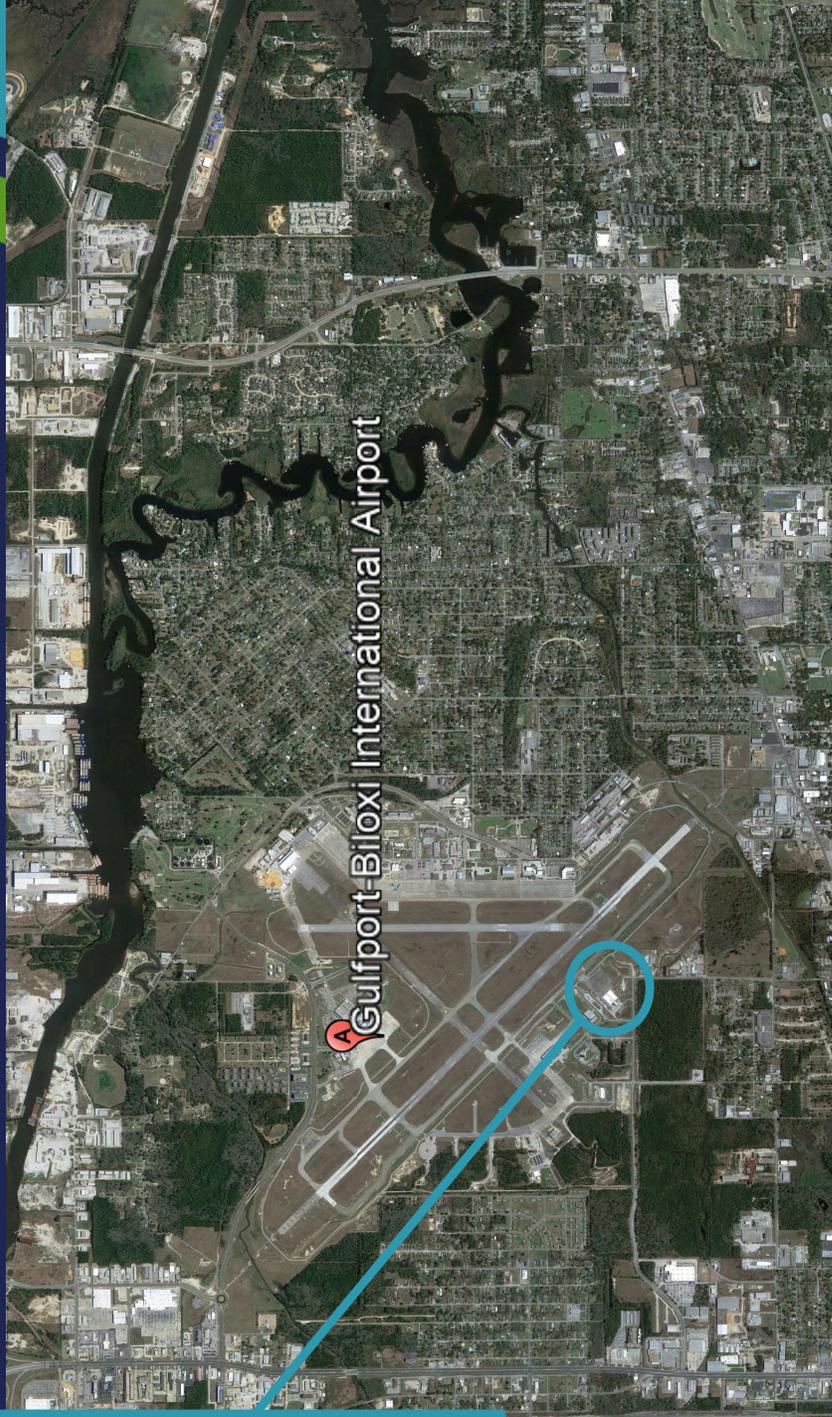


Source: Wallenius Wilhelmsen Solutions, <https://www.2wglobal.com/news-and-insights/articles/features/keeping-cargo-pest-free-in-baltimore/>, June 2018.

# Gulfport-Biloxi International Airport (Mississippi)

Operator: Gateway America

GCI CARGO USA



Source: Google Earth Pro, 2018;



Fumigation Facilities Relocation | September, 2018

DRAFT

# Gulfport-Biloxi International Airport (Mississippi)

Operator: Gateway America

- Facility Characteristics:
  - Building Size: 46,000 sq. ft.,
  - 10 loading dock positions,
  - Cold and dry storage,
  - Airside access.



Source: Gulfport-Biloxi Airport, Fact Sheet, March 2017.





## APPENDIX E

Design Ticket No. 130809513 and Log of  
Communications

---



## Valeska L. Colmenares

---

**From:** irth\_host@callsunshine.com  
**Sent:** Thursday, May 10, 2018 2:23 PM  
**To:** Valeska L. Colmenares  
**Subject:** SSOCOF CONFRM 2018/05/10 #00000 130809513-000 NORM DSGN NEW

**Categories:** meeting

EXTERNAL EMAIL: Do not click unknown links/attachments. Never give out your user ID or password.

---

---

CONFRM 00000 CALL SUNSHINE 05/10/18 14:22:58ET 130809513-000 DESIGN GRID Ticket : 130809513 Rev:000 Taken: 05/10/18 14:04ET

State: FL Cnty: DADE GeoPlace: MIAMI  
CallerPlace: MIAMI  
Subdivision:

Address :  
Street : NW 72ND AVE  
Cross 1 : NW 14TH ST  
Within 1/4 mile: Y

Locat: \*\*\*DESIGN\*\*\* THE PROPERTY BOUNDARIES ARE: NW 14TH ST TO THE SOUTH, NW 72ND AVE & CORPORATE WAY TO THE EAST, PALMETTO EXPY TO THE WEST AND W/IN 1200FT NORTH OF NW 14TH ST

Remarks : IN RESPONSE TO RECEIPT OF A DESIGN TICKET, SSOCOF PROVIDES THE ORIGINATOR OF THE DESIGN TICKET WITH A LIST OF SSOCOF MEMBERS IN THE VICINITY OF THE DESIGN PROJECT. SSOCOF DOES NOT NOTIFY SSOCOF MEMBERS OF THE RECEIPT BY SSOCOF OF A DESIGN TICKET. IT IS THE SOLE RESPONSIBILITY OF THE DESIGN ENGINEER TO CONTACT SSOCOF MEMBERS TO REQUEST INFORMATION ABOUT THE LOCATION OF SSOCOF MEMBERS' UNDERGROUND FACILITIES. SUBMISSION OF A DESIGN TICKET WILL NOT SATISFY THE REQUIREMENT OF CHAPTER 556, FLORIDA STATUTES, TO NOTIFY SSOCOF OF AN INTENT TO EXCAVATE OR DEMOLISH. THAT INTENT MUST BE MADE KNOWN SPECIFICALLY TO SSOCOF IN THE MANNER REQUIRED BY LAW. IN AN EFFORT TO SAVE TIME ON FUTURE CALLS, SAVE YOUR DESIGN TICKET NUMBER IF YOU INTEND TO BEGIN EXCAVATION WITHIN 90 DAYS OF YOUR DESIGN REQUEST. THE DESIGN TICKET CAN BE REFERENCED , AND THE INFORMATION ON IT CAN BE USED TO SAVE TIME WHEN YOU CALL IN THE EXCAVATION REQUEST.

\*\*\* LOOKUP BY MANUAL \*\*\*

Grids : 2547C8019C 2547C8019D 2547D8019C 2547D8019D

Work date: 05/10/18 Time: 14:05ET Hrs notc: 000 Category: 6 Duration: UNKNOWN Due Date : 05/14/18 Time: 23:59ET  
Exp Date : 06/11/18 Time: 23:59ET Work type: DESIGN Boring: U White-lined: U  
Ug/Oh/Both: U Machinery: N Depth: UNK Permits: U N/A Done for : DESIGN

Company : NOVA CONSULTING Type: CONT  
Co addr : 10486 NW 31ST TER  
City : MIAMI State: FL Zip: 33172  
Caller : VALESKA COLMENARES Phone: 305-436-9200 Ext: 240 Contact : DESIGN Phone:  
BestTime: MORNING  
Mobile : 786-449-8678  
Fax : 305-436-9265  
Email : VCOLMENARES@NOVA-CONSULTING.COM

Submitted: 05/10/18 14:04ET Oper: JES

Mbrs :

ATTF01 NANCY SPENCE 770-918-5424

ATT / T

2315 GEES MILL BUSINESS PKWY NE

CONYERS, GA 30013-1578

Level 1: NO

Level 2: NO

Level 3: YES, FEES WILL VARY

Level 4: NO

CC1280 LEONARD MAXWELL-NEWBOLD 954-447-8405

COMCAST CABLE

2601 SW 145TH AVE

MIRAMAR, FL 33027

Level 1: Member does not provide this service.

Level 2: Member does not provide this service.

Level 3: Member does not provide this service.

Level 4: Member does not provide this service.

CITYGS HARRY ROCHA 305-835-3612 Ext: 63612

FLORIDA CITY GAS

4045 NW 97TH AVE

DORAL, FL 33178

Level 1: SERVICES NOT PROVIDED BY MEMBER

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

DCPWT OCTAVIO VIDAL 305-412-0891 Ext: 201

DADE COUNTY PUBLIC WORKS AND TRAFFIC

13284 SW 120TH ST

MIAMI, FL 33186

Level 1: \$175.00 PER MILE OF PROJECT

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: \$250.00 PER HOUR

Level 4: \$500.00 PER TEST HOLE

FDOT06 THOMAS MILLER 305-470-5757

AECOM

1001 NW 111TH AVE

MIAMI, FL 33172

Level 1: SERVICES NOT PROVIDED BY MEMBER

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

FGT01 JOSEPH E. SANCHEZ 407-838-7171

FLORIDA GAS TRANSMISSION COMPANY

2405 LUCIEN WAY, SUITE 200

MAITLAND, FL 32751

Level 1: ENGINEERING \$70 / HR (2 HR MIN) CALL FOR ESTIMATE

Level 2: ENGINEERING \$70/HR FIELD TECH \$60/HR (2 HR MIN)

Level 3: FIELD TECH \$60/HR (2 HR MIN)

Level 4: FIELD TECH \$60/HR (2 HR MIN) SURVEY/VACUUM EXC NOT PROVIDED

FPLDAD EDGAR AGUILAR 386-586-6403

FLORIDA POWER & LIGHT

10705 QUAIL ROOST DR

MIAMI, FL 33157

Level 1: NO FEE

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

FPLFOD DANNY HASKETT 786-610-7073

CROWN CASTLE FIBER

9250 W FLAGLER ST

MIAMI, FL 33174

Level 1: NO CHARGE

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

FPLWEO EDGAR AGUILAR 386-586-6403

FLORIDA POWER & LIGHT

10705 QUAIL ROOST DR

MIAMI, FL 33157

Level 1: NO FEE

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

L3C900 NETWORK RELATIONS 877-366-8344 Ext: 2

LEVEL 3 COMMUNICATIONS LLC

1025 ELDORADO BLVD

BROOMFIELD, CO 80021

Level 1: CONTACT MEMBER DIRECTLY FOR FEE SCALE

Level 2: CONTACT MEMBER DIRECTLY FOR FEE SCALE

Level 3: CONTACT MEMBER DIRECTLY FOR FEE SCALE

Level 4: CONTACT MEMBER DIRECTLY FOR FEE SCALE

MCIU01 DEAN BOYERS 469-886-4238

MCI

400 INTERNATIONAL PKWY

RICHARDSON, TX 75081

Level 1: \$0

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

MDWS LAZARO GUERRA 786-268-5273

MIAMI DADE WATER SEWER

3575 S LEJEUNE RD

MIAMI, FL 33146

Level 1: AS-BUILDS PROVIDED AT COST OF \$5.00 PER SHEET

Level 2: SERVICES NOT PROVIDED BY MEMBER

Level 3: SERVICES NOT PROVIDED BY MEMBER

Level 4: SERVICES NOT PROVIDED BY MEMBER

QST885 GEORGE MCELVAIN           303-992-9931  
CENTURYLINK (FORMERLY QWEST COMMUNICATI  
700 W MINERAL AVE  
NE J31.2  
LITTLETON, CO 80120

Level 1: Call for fee.

Level 2: Call for fee.

Level 3: Call for fee.

Level 4: Call for fee.

SB2186

SBF23 DINO FARRUGGIO           561-997-0240  
AT & T/ DISTRIBUTION  
1120 S ROGERS CIR  
BOCA RATON, FL 33487

Level 1: FEE TO BE DETERMINED

Level 2: NOT PROVIDED BY MEMBER

Level 3: FEE TO BE DETERMINED

Level 4: NOT PROVIDED BY MEMBER

Utility Owner	Utility Type	Contact	Phone/Fax	Address	Email	Comments
COMCAST CABLE	Communications	LEONARD MAXWELL-NEWBOLD	954-447-8405	2601 SW 145TH AVE MIRAMAR, FL 33027	<a href="mailto:leonard_maxwell_newbold@cable.comcast.com">leonard_maxwell_newbold@cable.comcast.com</a>	Sent email on 5/11 with the location
FLORIDA CITY GAS	Gas	HARRY ROCHA	305-835-3612 Ext: 63612	4045 NW 97TH AVE DORAL, FL 33178		Voice message left on 5/14/2018
DADE COUNTY PUBLIC WORKS AND TRAFFIC	Traffic Signalization, Stormwater	OCTAVIO VIDAL	305-412-0891 Ext: 201	13284 SW 120TH ST MIAMI, FL 33186	<a href="mailto:ovidal@htlocating.com">ovidal@htlocating.com</a>	Sent email on 5/11 with the location
FLORIDA GAS TRANSMISSION COMPANY	Gas	JOSEPH E. SANCHEZ	407-838-7171	2405 LUCIEN WAY, SUITE 200 MAITLAND, FL 32751	<a href="mailto:joseph.e.sanchez@energytransfer.com">joseph.e.sanchez@energytransfer.com</a>	Sent email on 5/11 with the location
FLORIDA POWER & LIGHT	Electric	EDGAR AGUILAR	386-586-6403	10705 QUAIL ROOST DR MIAMI, FL 33157	<a href="mailto:edgar.aguilar@fpl.com">edgar.aguilar@fpl.com</a>	Sent email on 5/11 with the location
MIAMI DADE WATER SEWER	Water, Wastewater	LAZARO GUERRA	786-288-5273	3575 S LEJEUNE RD MIAMI, FL 33146		Water and Sewer As-Builts obtained via MDWASD GIS database
AT & T DISTRIBUTION	Communications	DINO FARRUGGIO	561-997-0240	1120 S ROGERS CIR BOCA RATON, FL 33487	<a href="mailto:df1979@att.com">df1979@att.com</a>	Sent email on 5/14 with the location
ATT / T	Communications	NANCY SPENCE	770-918-5424	2315 GEES MILL BUSINESS PKWY NE CONYERS, GA 30013-1578		Voice message left on 5/14/2018
FDOT - AECOM	Communications	THOMAS MILLER	305-206-2600	1001 NW 111TH AVE MIAMI, FL 33172	<a href="mailto:Thomas.miller@sunguide.info">Thomas.miller@sunguide.info</a>	Sent email on 5/11 with the location
FPL - MDAD	Airport	ROBERT W GARDNER	305-345-3229	MIA	<a href="mailto:robert_w_gardner@fpl.com">robert_w_gardner@fpl.com</a>	Sent email on 5/15 with the location and MDAD sign off sheet
FAA - MDAD	Airport	JEFF COOPER	305-869-5349	MIA	<a href="mailto:jeff.b.cooper@faa.gov">jeff.b.cooper@faa.gov</a>	Sent email on 5/15 with the location and MDAD sign off sheet
MDAD IRRIGATION	Airport	FRANK CONTRERAS	305-796-7746 Mobile 305-869-4760 Office	MIA	<a href="mailto:fcontreras@miami-airport.com">fcontreras@miami-airport.com</a>	Sent email on 5/15 with the location and MDAD sign off sheet
MDAD UTILITIES	Airport	FRED HERBERT	305-876-7542	MIA	<a href="mailto:frberbt@miami-airport.com">frberbt@miami-airport.com</a>	Sent email on 5/15 with the location and MDAD sign off sheet
BLACK BOX - COMMUNICATIONS	Communications - Airport	CABLE FACILITIES DEPT	305-876-8416	MIA	<a href="mailto:bbns-miami-administration@blackbox.com">bbns-miami-administration@blackbox.com</a>	Sent email on 5/15 with the location and MDAD sign off sheet. Received sign off sheet signed MDAD has no underground utilities in this area; I do recommend G.P.R. and soft dig at this location
FPL - CROWN CASTLE FIBER		DANNY HASKETT	786-610-7073	9250 W FLAGLER ST MIAMI, FL 33174	<a href="mailto:danny.haskett@crowncastle.com">danny.haskett@crowncastle.com</a> <a href="mailto:fiber.dig@crowncastle.com">fiber.dig@crowncastle.com</a>	Sent email on 5/14 with the location FiberNet Direct Florida, LLC has underground fiber optic facilities within or near the limits of the above-referenced project
LEVEL 3 COMMUNICATIONS LLC	Communications	NETWORK RELATIONS	877-366-8344 Ext: 2	1025 ELDORADO BLVD BROOMFIELD, CO 80021	<a href="mailto:level3_networkrelocation@level3.com">level3_networkrelocation@level3.com</a>	Sent email on 5/14 with the location In response to your inquiry please find the enclosed drawings indicating the approximate location of the CenturyLink telecommunications facilities
CENTURYLINK (FORMERLY QWEST COMMUNICATI	Communications	GEORGE MCELVAIN	303-992-9931	700 W MINERAL AVE NE J31.2 LITTLETON, CO 80120		Voice message left on 5/14/2018
MCI		DEAN BOYERS	469-886-4238	400 INTERNATIONAL PKWY RICHARDSON, TX 75081	<a href="mailto:investigations@verizon.com">investigations@verizon.com</a>	Sent email on 5/14 with the location Verizonbusiness (MCI) DOES HAVE Facilities in the area





## APPENDIX F

# Miami-Dade Water and Sewer Department Sewer Atlas

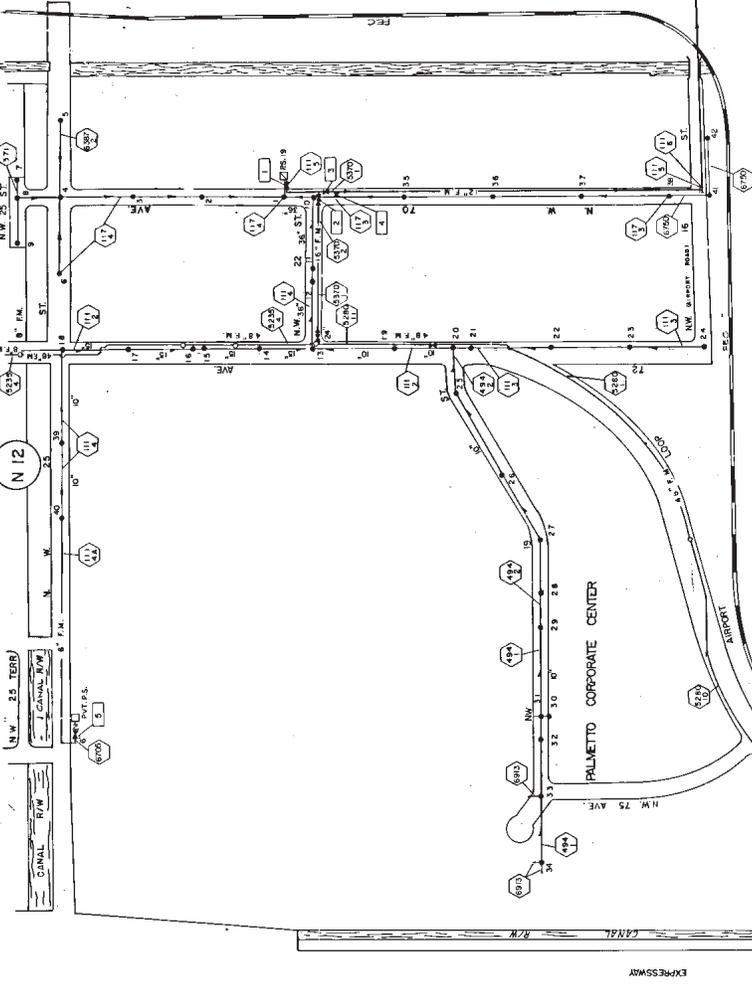
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REV 6-03-98 ON  
1-05-98 ON  
4-30-95 ON

N.W. 25 TERR.  
SIGNAL R/W  
CANAL R/W  
6 P.M. ST.

N 12

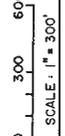
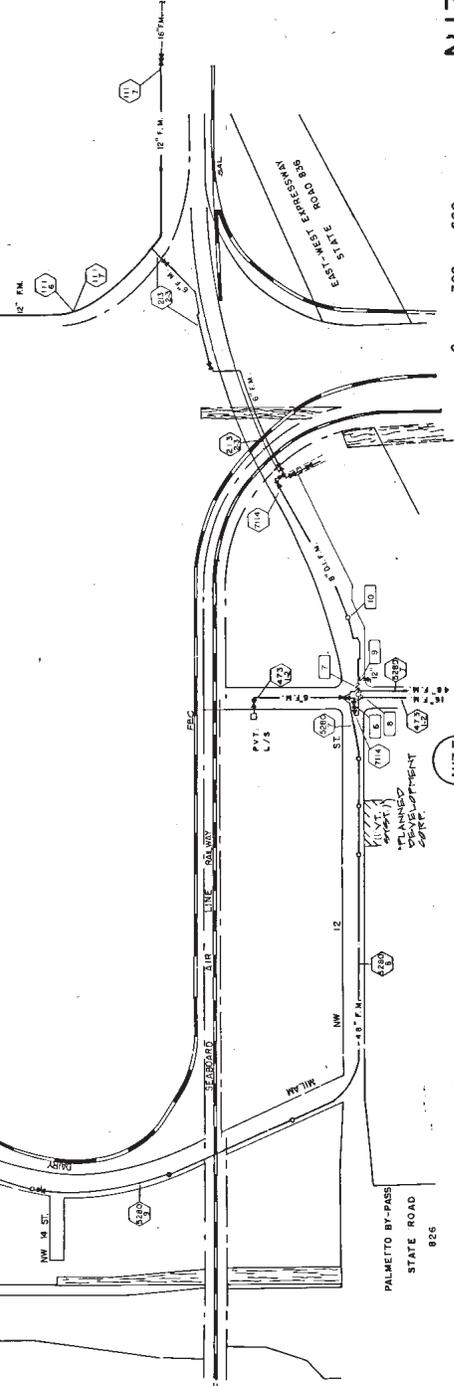


P 12

M 13



NOTE:  
FOR MIAMI INTERNATIONAL AIRPORT  
PVI SYSTEM SEE ES 6703-1 & 2.



N 13

N 13.5

SEC. 35 TWP. 53 S. RGE. 40 E.





## APPENDIX G

# Miami-Dade Water and Sewer Department Water Atlas

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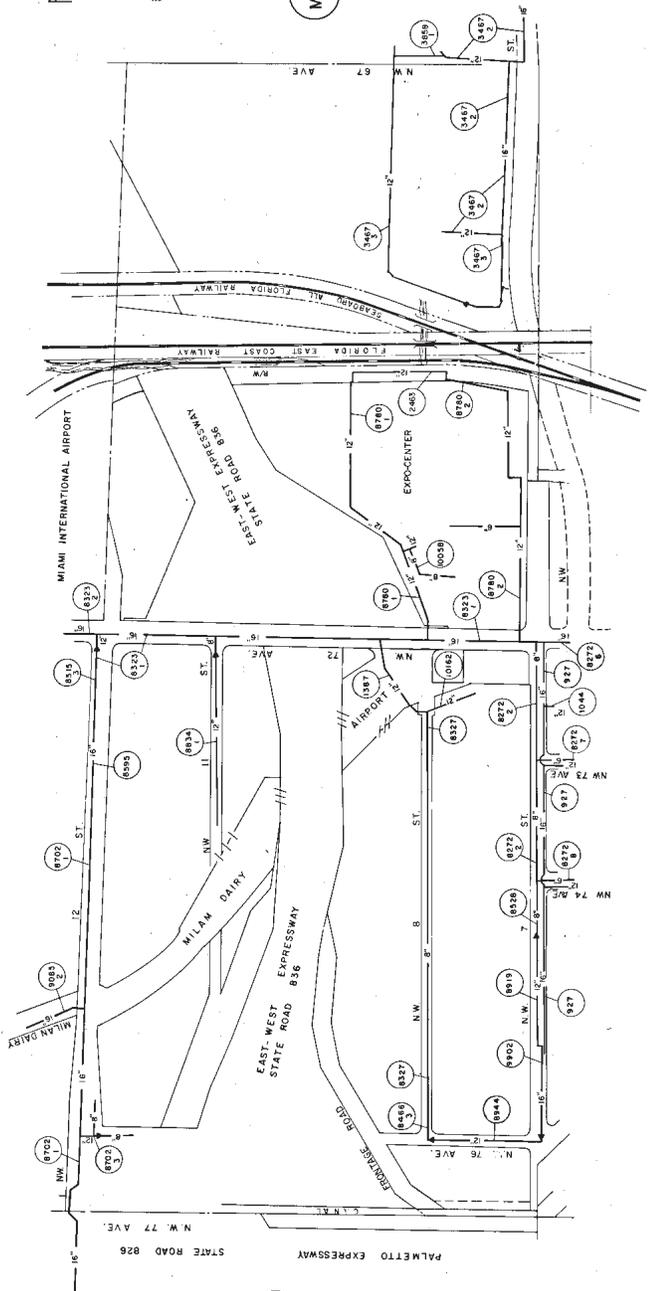
N135

N13

SEC. 35-53-40



M13



P135

SEC. 2-54-40

N14



LOT 2 between TWP. 53 & 54 RGE. 40

N135



## APPENDIX H

# Federal Emergency Management Agency – Flood Insurance Rate Map for Proposed Facility Site

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# National Flood Hazard Layer FIRMette



25°47'34.84"N



80°18'51.95"W

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**

- Without Base Flood Elevation (BFE)  
*Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**

- Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs *Zone D*
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**Cross Sections with 1% Annual Chance Water Surface Elevation**

- 20.2
- 17.5
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study

**OTHER FEATURES**

- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**

- Digital Data Available
- No Digital Data Available
- Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/9/2018 at 1:47:13 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.





## APPENDIX I

# Preliminary Cost Estimates

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TABLE I-1 (1 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
<b>General Conditions</b>				
General Conditions	14%	-	-	\$3,145,255
General Contractor Overhead and Profit	5%	-	-	\$1,123,306
Bond and Fees	3%	-	-	\$673,983
<b>Subtotal - General Conditions</b>				<b>\$4,942,544</b>
<b>Existing Conditions</b>				
Demolition				\$-
<b>SUBTOTAL - Existing Conditions</b>				<b>\$-</b>
<b>Concrete</b>				
Underslab Vapor Barrier	96,000	sf	\$0.30	\$28,800
Concrete Forming	1	included in 033000		\$-
Concrete Reinforcing	1	included in 033000		\$-
Cast-in-Place Concrete	-	-	-	\$3,400,800
Concrete Floor Finishing	96,000	sf	\$2.50	\$240,000
Tilt-up Concrete (walls)	60,000	sf	\$18.00	\$1,080,000
<b>Subtotal - Concrete</b>				<b>\$4,749,600</b>
<b>Masonry</b>				
Concrete Unit Masonry	-	-	-	\$1,220,000
Reinforced Unit Masonry	-	-	-	\$72,800
<b>Subtotal - Masonry</b>				<b>\$1,292,800</b>
<b>Metals</b>				
Structural Steel Framing	850	ton	\$2,200.00	\$1,870,000
Steel Joist Framing	350	ton	\$1,750.00	\$612,500
Steel Decking	100,000	sf	\$5.00	\$500,000
Metal Stairs	1	LS(allow)	\$100,000.00	\$100,000
Pipe and Tube Railings	1	LS(allow)	\$49,500.00	\$49,500
<b>Subtotal - Metals</b>				<b>\$3,132,000</b>
<b>Wood, Plastic and Composites</b>				
Rough Carpentry	96,000	sf	\$2.00	\$192,000
Architectural Wood Casework	1	LS(allow)	\$100,000.00	\$100,000
<b>Subtotal - Wood, Plastic and Composites</b>				<b>\$292,000</b>

TABLE I-1 (2 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
<b>Moisture and Thermal Protection</b>				
Thermal Insulation				
Polyiso board insulation - roof assembly	96,000	sf	\$2.50	\$240,000
XPS board insulation - exterior walls	59,000	sf	\$2.00	\$118,000
Batt insulation - interior walls	17,500	sf	\$0.55	\$9,625
Insulated Wall Panels				
Fumigation Pallets Area	56000	sf	\$8.50	\$476,000
Cold Storage Area	30000	sf	\$9.50	\$285,000
Pre-Cold Staging	16500	sf	\$8.50	\$140,250
Thermoplastic Membrane Roofing	96,000	sf	\$28.00	\$2,688,000
Sheet Metal Flashing and Trim	3,600	lf	\$3.00	\$10,800
Roof Specialties	1	LS(allow)	89,300	\$89,300
Firestopping	1	LS (allow)	\$100,000.00	\$100,000
Joint Sealants	1	LS (allow)	\$100,000.00	\$100,000
<b>Subtotal - Moisture and Thermal Protection</b>				<b>\$4,256,975</b>
<b>Openings</b>				
Hollow Metal Doors and Frames	1	LS (allow)	\$130,150.00	\$130,150
Overhead Coiling Doors	1	LS (allow)	\$842,800.00	\$842,800
Aluminum-Framed Storefronts	250	sf	\$150.00	\$37,500
Aluminum Windows	250	sf	\$80.00	\$20,000
Fixed Wall Louvers	1,000	sf	\$65.00	\$65,000
<b>Subtotal - Openings</b>				<b>\$1,095,450</b>
<b>Finishes</b>				
Gypsum Board Assemblies	17,440	sf	\$12.50	\$218,000
Cement Plastering	1	LS (allow)	\$23,000.00	\$23,000
Tiling				
Interior - Wall	2400	sf	\$12.00	\$28,800
Interior - Floor	3200	sf	\$10.00	\$32,000
Ceiling Panels				
Acoustical Ceiling Panels	12,000	sf	\$4.00	\$48,000
Insulated Ceiling Panels	60000	sf	\$7.50	\$450,000
Resilient Flooring	7500	sf	\$5.20	\$39,000
Painting and Coating				
Painting Interior Walls	75,000	sf	\$3.00	\$225,000
Painting Exterior Walls	65,600	sf	\$3.50	\$229,600
Painting Doors	65	ea	\$150.00	\$9,750
Paint Mech Equip	1	ls	\$25,000.00	\$25,000
<b>Subtotal - Finishes</b>				<b>\$1,328,150</b>

TABLE I-1 (3 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
<b>Specialties</b>				
Information Specialties	-	-	-	\$19,000
Toilet Compartments	1	LS (allow)	\$22,000.00	\$22,000
Toilet Accessories	-	-	-	\$43,735
Fire Protection Specialties	-	-	-	\$15,000
Storage Specialties	-	-	-	\$6,600
Exterior Specialties	-	-	-	\$50,000
<b>Subtotal - Specialties</b>				<b>\$156,335</b>
<b>Equipment</b>				
<b>Subtotal - Equipment</b>				<b>\$-</b>
<b>Furnishings</b>				
Window Shades	1	ls	\$25,000.00	\$25,000
Entrance Floor Mats	12	ea	\$2,000.00	\$24,000
<b>Subtotal - Furnishings</b>				<b>\$49,000</b>
<b>Special Construction</b>				
<b>Subtotal - Special Construction</b>				<b>\$-</b>
<b>Conveyance</b>				
<b>Subtotal - Conveyance</b>				<b>\$-</b>
<b>Fire Supression</b>				
NFPA 13 system	96,000	sf	\$7.00	\$672,000
<b>Subtotal - Fire Supression</b>				<b>\$672,000</b>
<b>Plumbing</b>				
<b>Subtotal - Plumbing</b>				<b>\$796,600</b>
<b>HVAC</b>				
<b>Subtotal - HVAC</b>				<b>\$844,800</b>
<b>Electrical</b>				
<b>Subtotal - Electrical</b>				<b>\$998,400</b>
<b>Earth Work</b>				
Site Clearing				
Site Clearing	22	ac	\$8,500.00	\$187,000
Tree Removal	100	ea	\$750.00	\$75,000
Grading	22	ac	\$20,000.00	\$440,000
Excavation				
Trenching and Rock Removal	1	LS (allow)	\$250,000.00	\$250,000
Underground Removal	1	LS (allow)	\$250,000.00	\$250,000
Fill - compacted building	64,000	cy	\$28.00	\$1,792,000
Termite Control	96,000	sf	\$0.50	\$48,000
<b>Subtotal - Earth Work</b>				<b>\$3,042,000</b>

TABLE I-1 (4 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
<b>Exterior Improvements</b>				
<b>Subtotal - Exterior Improvements</b>				<b>\$-</b>
<b>Utilities</b>				
Excavation and Backfill for Water Main Connection 8" D.I.	1	LS	\$2,400.00	<b>\$2,400</b>
Excavation and Backfill for Fire Line - 6" D.I.	1	LS	\$3,500.00	<b>\$3,500</b>
Excavation and Backfill for Water Service - 2" Copper	1	LS	\$8,800.00	<b>\$8,800</b>
Excavation and Backfill for Grinder Pump Package System, 2" Ductile Iron Force Main, and 4" Cast Iron Gravity Main	1	LS	\$15,300.00	<b>\$15,300</b>
Excavation and Backfill for Power and Comm. Ductbank	1	LS	\$2,200.00	<b>\$2,200</b>
Installation of Water Main Connection 8" D.I.	66	LF	\$307.58	<b>\$20,300</b>
Installation one (1) fire hydrant	1	EA	\$7,500.00	<b>\$7,500</b>
Installation of Fire Line - 6" D.I.	443	LF	\$138.37	<b>\$61,300</b>
Installation of Water Service - 2" Copper	1332	LS	\$40,200.00	<b>\$40,200</b>
Installation Grinder Pump Package System, 2" Ductile Iron Force Main, and 4" Cast Iron Gravity Main	1	LS	\$127,500.00	<b>\$127,500</b>
Installation Power and Communication Ductbank (350 LF for Electrical Ductbank and 205 LF for Communication Ductbank. Cables not included)	1	LS	\$37,500.00	<b>\$37,500</b>
Parking Lot Appurtenances (assume 23 parking spaces. Cost does not include site lighting)	1	LS	\$8,100.00	<b>\$8,100</b>
Pavement Installation for Access Road and Parking Lot Area	211,784	SF	\$3.00	<b>\$636,100</b>
Drainage System (9 curb catch basins, 8 catch basin manholes)	1	LS	\$192,700.00	<b>\$192,700</b>
Retention Ponds	1	LS	\$51,700.00	<b>\$51,700</b>
Erosion and Sedimentation Controls	1	LS	\$2,400.00	<b>\$2,400</b>
Grading and Site Restoration	1	LS	\$85,300.00	<b>\$85,300</b>
Cleaning and Grubbing	8	Acre	\$7,869.05	<b>\$66,100</b>
<b>Subtotal - Utilities</b>				<b>\$1,368,900</b>

TABLE I-1 (5 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

<b>Subtotal Trades</b>		<b>\$24,075,010</b>
General Conditions	-	\$4,942,544
Construction Contingency for Level of Design	15.00%	\$3,611,252
Design Development	20.00%	\$4,815,002
Contractors Costs	19.50%	\$4,694,627
<b>Total Construction</b>		<b>\$42,138,434</b>
A/E Services Including Owner's Allowance	16.00%	\$6,742,150
Construction Support Including Owner's Allowance	26.50%	\$11,166,685
Potential Environmental Contamination Mitigation Allowance		\$273,780
Indirect Costs	6.50%	\$2,738,998
<b>Total Project Cost (2018 Dollars)</b>		<b>\$63,060,047</b>

NOTE: Phase 1 is <100,000 sf OLF for Occupancy Group S (warehouse) or F (factory/industrial) is 500 sf per occupant, so total number of occupants is 200 (100 male + 100 female). Per FBC-B Table 2902.1, the minimum quantity of plumbing fixtures is: 1 WC + 1 LAV for 100 men, and 1 WC + 1 LAV for 100 women. However, plans assume separate facilities will be required for each tenant; supplemental facilities will be required at the opposite end of the building (due to travel distance).

SOURCES: M C Harry Architects, Jet Engine Test Cell - Rough Order of Magnitude (ROM) Estimate, December 2018; Nova Consulting, MIA Engine Test Cell Facility ROM Cost Estimate, June 2019; Aguirre Project Resources, LLC, Cost Estimate Soft Costs, December 2018.

TABLE I-2 ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE – DETAILED SOFT COSTS

DESCRIPTION	%	AMOUNT
<b>Subtotal Trades</b>		<b>\$24,075,010</b>
General Conditions	-	\$4,942,544
Construction Contingency for Level of Design	15.00%	\$3,611,252
Design Development	20.00%	\$4,815,002
Contractors Costs	19.50%	\$4,694,627
Core General Conditions / Staff	10.00%	\$2,407,501
Bond, Insurance and Builders Risk	3.00%	\$722,250
Constructability Review	1.00%	\$240,750
General Administration and Profit	5.50%	\$1,324,126
<b>Total Construction</b>		<b>\$42,138,434</b>
A/E Services Including Owner's Allowance	16.00%	\$6,742,150
A/E Basic	6.00%	\$2,528,306
Owner's Allowance Account - A/E Basic	10.00%	\$4,213,843
Construction Support Including Owner's Allowance	26.50%	\$11,166,685
A/E Additional	3.50%	\$1,474,845
PM / CM Services	4.50%	\$1,896,230
Construction and Inspection Services (CIS)	3.00%	\$1,264,153
Estimating Services	0.75%	\$316,038
Scheduling Services	0.75%	\$316,038
Permitting Costs	0.50%	\$210,692
Commissioning	1.00%	\$421,384
Misc. Inspections Fee - Threshold, Fire Proofing	1.00%	\$421,384
Testing Services	1.50%	\$632,077
Owner's Allowance Account - A/E Additional	10.00%	\$4,213,843
Potential Environmental Contamination Mitigation Allowance		\$273,780
Indirect Costs	6.50%	\$2,738,998
Consultant Costs	1.50%	\$632,077
MDAD Costs	2.50%	\$1,053,461
Authority Having Jurisdiction (AHJ)	1.50%	\$632,077
AIPP	1.00%	\$421,384
<b>Total Project Cost (2018 Dollars)</b>		<b>\$63,060,047</b>

SOURCES: M C Harry Architects, Jet Engine Test Cell - Rough Order of Magnitude (ROM) Estimate, December 2018; Nova Consulting, MIA Engine Test Cell Facility ROM Cost Estimate, June 2019; Aguirre Project Resources, LLC, Cost Estimate Soft Costs, December 2018.